

APPENDIX B

HAZARDOUS MATERIALS RISK ASSESSMENT

This Appendix contains supporting documentation for the rail operations, rail operations safety, and hazardous materials transport information presented in Sections 3.1.3, 3.1.4, and 3.2.2, respectively, of this SDEIS. This Appendix includes a quantitative assessment of the type and estimated volume of hazardous material that would be transported by RJCP within the project area, a qualitative evaluation of the hazardous characteristics of this material, a statistical analysis of the probability of a derailment event that would result in a release of this hazardous material, and an evaluation of the potential environmental impacts/safety consequences that would be associated with a release of this hazardous material into the project area. OEA also summarizes the applicable hazardous materials transportation safety requirements that RJCP would have to comply with, should the Board approve its petition.

INTRODUCTION

RRLLC submitted written correspondence to OEA on October 5, 2010 (see Appendix A) outlining several technological advances that have resulted in changes to its proposed development project. Most notable is RRLLC's planned development of a waste-to-ethanol facility and the transport of ethanol over RJCP's proposed rail line. Following RRLLC's announcement, RJCP submitted written correspondence to OEA on November 17, 2010 (see Appendix A) indicating that it already transports approximately 20 to 30 carloads of ethanol per month over its existing lines from an ethanol plant located in Clearfield, Pennsylvania, and that it would be willing to provide outbound transport of RRLLC's estimated five carloads of ethanol per day from the proposed waste-to-ethanol facility. RJCP's planned transport of ethanol outbound from the RRLLC facility prompted OEA to complete this hazardous materials risk assessment.

Risk assessment is a process that uses statistical data combined with project-specific information to not only predict or estimate the probability for a particular type of event to occur, but also, to evaluate the potential ramifications of such an event if it actually occurs. Risk assessments provide decision-makers with important information about the likelihood and severity of a particular event, not just the worst-case scenario. Quantitative risk assessments combine statistical data and mathematical equations to calculate an estimated probability of occurrence for a given event. For purposes of OEA's risk assessment, this estimated probability of occurrence has been calculated based on certain project-specific information (i.e., RJCP's railroad operating class) and historical event data. Combined with other project-specific information (i.e., the anticipated volume of ethanol to be transported on a daily basis), the known hazardous characteristics of ethanol and affected environment information presented in Chapter 3 of the DEIS, OEA was able to draw conclusions about the potential risk that would be associated with RJCP's planned transport of ethanol. When conducted for different alternatives, as is the case here, risk assessment information can also be used in the alternatives analysis process. Therefore, OEA conducted the hazardous materials risk assessment for both the Proposed Action and the Modified Proposed Action to determine if one alternative is more environmentally preferable than the other from a risk/exposure/impact perspective. Similarly, OEA qualitatively evaluated the Local Road System Upgrade alternative and the No-Action Alternative for direct comparison to the rail alternatives. Finally, OEA summarizes the applicable hazardous materials transportation safety requirements that RJCP would have to comply with, should the Board approve its petition.

HAZARDOUS MATERIAL ANTICIPATED TO BE TRANSPORTED

The only hazardous material RJCP anticipates transporting over the proposed rail line is fuel-grade or denatured (i.e., rendered undrinkable) ethanol. In the U.S., ethanol must be denatured before shipping (to render it non-potable to avoid taxes on alcohol that would otherwise apply) by adding gasoline or gasoline-range hydrocarbons at a concentration of 2-5%.¹ In its November 17, 2010 correspondence, RJCP indicates that it currently transports approximately 20 to 30 carloads of ethanol per month over its existing lines from an ethanol plant located in Clearfield, Pennsylvania, and would be willing to provide outbound transport of RRLLC's estimated five carloads of ethanol per day from the proposed waste-to-ethanol facility as well. This five-carload per day peak transport is based on RRLLC's estimated annual ethanol production capacity of 50,000,000 gallons. Based on a six-day work week, RRLLC's estimated annual ethanol production capacity would equal approximately 160,256 gallons per day. Transport of this commodity using industry standard 33,000-gallon tanker cars would equal 4.86 tanker cars per day at peak production.

In its letter, RJCP stated that the addition of five tanker cars of ethanol would not alter its planned rail operations (i.e., one inbound train and one outbound train per day). The five ethanol cars (inbound empty and outbound loaded) would simply be added to the daily train. Therefore, for purposes of this analysis, OEA has assumed a typical average daily hazardous material load of five 33,000-gallon tanker cars of ethanol on one outbound train, although that could vary somewhat depending on RRLLC's daily production levels. The daily inbound shipment of empty tanker cars has no bearing on OEA's hazardous materials risk assessment, as empty tanker cars pose no risk. In other words, RJCP only anticipates transporting ethanol in one direction (i.e., outbound from the RRLLC facility).

Ethanol, also known as ethyl alcohol, pure alcohol, grain alcohol, or drinking alcohol, is a volatile, flammable, clear colorless liquid. It is most commonly known as the type of alcohol in alcoholic beverages and thermometers. Ethanol is a straight-chain alcohol having a molecular formula of C_2H_5OH and an empirical formula of C_2H_6O . Ethanol is often abbreviated as EtOH, using the common organic chemistry notation representing the ethyl group (C_2H_5) with Et. Ethanol has widespread use as a solvent of substances intended for human contact or consumption, including scents, flavorings, colorings, and medicines. In the chemical manufacturing industry, it is commonly used as a base chemical for the production of other organic compounds. It has a long history as a fuel for heat and light, and more recently as a fuel for internal combustion engines.² According to the American Coalition for Ethanol, it is a clean-burning, high-octane motor fuel that is produced from renewable resources. USEPA recommends ethanol as an oxygen rich additive to promote more controlled burning in the manufacture of reformulated gasoline. This recommendation is based on ethanol's physical properties that allow it to quickly biodegrade (breakdown) when released into the environment. According to USEPA,³ the reported half-life of ethanol in surface waters is short, spanning 6.5 to 26 hours. The reported half-life of ethanol under anaerobic conditions (meaning

¹ See U.S. National Response Team 2010, *Quick Reference Guide: Fuel Grade Ethanol Spills (Including E85)*.

² See Meyers, R. L. & Myers, R. L. 2007, *The 100 Most Important Chemical Compounds: A Reference Guide*.

³ On March 24, 2000, USEPA published an Advance Notice of Intent To Initiate Rulemaking in the *Federal Register* regarding its authority under the Toxic Substances Control Act (40 C.F.R. § 755) to eliminate or limit the use of Methyl Tertiary Butyl Ether (MTBE) as a fuel additive in gasoline due to its documented potential to pollute the environment. In this publication, USEPA states that the most likely substitute based on current usage is ethanol and documents the differences in environmental toxicity that exist between MTBE and ethanol, including reported half-lives.

without oxygen) ranges from 1 to 4.3 days. Tables B-1 and B-2 summarize the health and safety characteristics and natural resource hazard classifications of ethanol, specifically fuel-grade or denatured ethanol.

TABLE B-1
HEALTH AND SAFETY CHARACTERISTICS OF ETHANOL

CHARACTERISTIC	ETHANOL ¹
Natural State	Clear, colorless liquid
USDOT Shipping Name	Denatured Alcohol
USDOT Hazard Class	Class 3 (Flammable Liquid)
NFPA Chemical Hazard Rating ²	Health = 2 Flammability = 3 Reactivity = 0
Spill or Leak Considerations	Remove all sources of ignition including use of spark-proof tools
Firefighting Considerations	Flammable liquid and vapor, lighter than water and soluble in water
Toxicity Concerns	Causes severe eye irritation, respiratory tract irritation, and moderate skin irritation. May cause adverse reproductive and fetal effects in humans
Stability	Stable though incompatible with strong oxidizing agents

¹ Information taken from the Material Safety Data Sheet for Denatured Alcohol

² Explanation of National Fire Protection Association (NFPA) Chemical Hazard Rating System:

Health

- 4 – Danger – May be fatal on short exposure. Specialized protective equipment required
- 3 – Warning – Corrosive or toxic. Avoid skin contact or inhalation
- 2 – Warning – May be harmful if inhaled or absorbed
- 1 – Caution – May be irritating
- 0 – No unusual hazard

Flammability

- 4 – Danger – Flammable gas or extremely flammable liquid
- 3 – Warning – Flammable liquid flash point below 100°F
- 2 – Caution – Combustible liquid flash point of 100 to 200°F
- 1 – Combustible if heated
- 0 – Not combustible

Reactivity

- 4 – Danger – Explosive material at room temperature
- 3 – Danger – May be explosive if shocked, heated under confinement or mixed with water
- 2 – Warning – Unstable or may react violently if mixed with water
- 1 – Caution – May react if heated or mixed with water but not violently
- 0 – Stable – Not reactive when mixed with water

TABLE B-2
NATURAL RESOURCE HAZARD CLASSIFICATIONS OF ETHANOL

NATURAL RESOURCE HAZARD	ETHANOL
Marine Pollutant ¹	No
Aquatic Toxicity	Not expected to significantly bioaccumulate
GESAMP Damage to Living Resources (Non-human) Ranking ²	1
GESAMP Bioaccumulation and Tainting Ranking ²	O

¹ Marine Pollutant identified by USDOT regulations 49 C.F.R. § 172.101.

² Explanation of Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP) Hazard Profile Ranking System:

Damage to Living Resources (96-hour lethal concentration)

5 – Extremely toxic (less than 0.01 mg/l)

4 – Highly toxic (less than 1 mg/l)

3 – Moderately toxic (1-10 mg/l)

2 – Slightly toxic (10-100 mg/l)

1 – Practically nontoxic (100-1,000 mg/l)

0 – Non-hazardous (greater than 1,000 mg/l)

Bioaccumulation and Tainting

+ – Bioaccumulation to significant extent and known to produce a hazard to aquatic life and human health

Z – Bioaccumulation with attendant risk to aquatic organisms or human health, however, with short retention of the order of one week or less

T – Liable to produce tainting of seafood

O – No evidence to support one of the above ratings (+,Z,T)

ASSESSMENT OF PROBABILITY FOR A HAZARDOUS MATERIALS RELEASE

Using national accident/incident statistics on the FRA Office of Safety Analysis website, OEA calculated both an average annual mainline train accident (i.e., accidents occurring along mainline railroad routes, not including yards, sidings, or spurs) rate per million train miles and an average annual mainline train accident rate for accidents that would result in a release of hazardous materials per million train miles for smaller Class III rail carriers like RJCP. These national Class III railroad average annual mainline train accident rates were then used to calculate an estimated probability of annual occurrence and return year interval (an estimate of time between accidents) for each type of accident on RJCP's proposed rail line. OEA calculated an average annual mainline train accident rate and an average annual mainline train accident rate for accidents that would result in a release of hazardous materials to quantify the statistical disparity between these two types of events. OEA's analysis shows that a very small number of train accidents actually results in a release of hazardous materials. OEA used mainline train accident data for Class III railroads because these statistical data are most similar to RJCP's anticipated operations over the proposed rail line. Accident/incident data specific to yard track and collisions were not considered applicable to this study.

The first step in the statistical analysis was to compile national data on the total number of annual mainline train accidents involving Class III railroad operators for the years available on the FRA Office of Safety Analysis website. Once the total number of annual mainline train accidents for Class III railroads was identified, the total mainline train mileage was used to calculate a mainline train accident rate per million train miles for each year included in the assessment. OEA calculated

a mainline train accident rate for the years 2001-2009. These data were then used to calculate an average annual mainline train accident rate per million train miles for the nine-year period. Table B-3 summarizes the data that were used in the calculations.

TABLE B-3
2001-2009 ANNUAL MAINLINE TRAIN ACCIDENT DATA
FOR CLASS III RAILROAD OPERATORS

YEAR	NUMBER OF MAINLINE TRAIN ACCIDENTS	MAINLINE TRAIN MILEAGE	MAINLINE TRAIN ACCIDENT RATE PER MILLION TRAIN MILES
2001	110	10,535,505	10.4
2002	75	10,839,954	6.9
2003	95	10,915,362	8.7
2004	96	11,693,958	8.2
2005	119	13,015,652	9.1
2006	122	13,919,979	8.8
2007	114	14,927,315	7.6
2008	90	15,076,368	6.0
2009	78	16,076,343	4.9
AVERAGE			7.8

Using the average annual mainline train accident rate combined with the estimated annual train miles for RJCP's anticipated rail operations, OEA was able to calculate an annual probability of occurrence and return year interval for a mainline train accident on RJCP's proposed rail line. OEA decided to use the 20-mile project length of the Proposed Action instead of the 19-mile project length of the Modified Proposed Action because that would produce a conservative "worst case scenario" from an annual mileage perspective (i.e., 12,480 annual train miles under the Proposed Action, as opposed to 11,856 annual train miles under the Modified Proposed Action). OEA's analysis, however, shows that this 600-mile difference in annual train mileage between the Proposed Action and the Modified Proposed Action produces only minimally different results (i.e., less than one half of one percent) in the statistical probability of an annual occurrence. Table B-4 shows the data used in the calculations, as well as the calculation results.

TABLE B-4
ESTIMATED ANNUAL TRAIN ACCIDENT RATE
FOR RJCP'S PROPOSED RAIL LINE

2001-2009 Average Annual Mainline Train Accident Rate Per Million Train Miles for Class III Railroad Operators	7.8
Estimated RJCP Train Mileage Per Year (1 train/day @ 40 miles/roundtrip @ 312 days/year)	12,480
Estimated RJCP Train Accident Rate Per Year	0.097 (9.7%)
Estimated RJCP Train Accident Return Year Interval	10.3

Based on OEA's analysis, there is a 0.097 (9.7%) annual probability of occurrence for a mainline train accident on the proposed rail line. This would result in an estimated return year interval (an estimate of time between accidents) of one accident every 10.3 years.

After calculating RJCP's annual probability of occurrence and return year interval for a mainline train accident, OEA, using that data, calculated mainline train accidents that would result in a

release of hazardous materials. OEA used national accident/incident statistics for Class III railroad operators over the same nine-year period discussed above (2001 to 2009) to calculate an average annual mainline train accident rate for accidents resulting in a release of hazardous materials. Table B-5 presents the FRA data that OEA used to calculate the average annual mainline train accident rate for accidents resulting in a release of hazardous materials per million train miles.

TABLE B-5
2001-2009 ANNUAL MAINLINE TRAIN ACCIDENT DATA
FOR ACCIDENTS RESULTING IN A RELEASE OF HAZARDOUS MATERIALS
FOR CLASS III RAILROAD OPERATORS

YEAR	NUMBER OF MAINLINE TRAIN ACCIDENTS RESULTING IN A RELEASE OF HAZARDOUS MATERIALS	MAINLINE TRAIN MILEAGE	MAINLINE TRAIN ACCIDENT RATE FOR ACCIDENTS RESULTING IN A RELEASE OF HAZARDOUS MATERIALS PER MILLION TRAIN MILES
2001	1	10,535,505	0.095
2002	1	10,839,954	0.092
2003	0	10,915,362	0.000
2004	2	11,693,958	0.171
2005	2	13,015,652	0.154
2006	2	13,919,979	0.144
2007	4	14,927,315	0.268
2008	0	15,076,368	0.000
2009	2	16,076,343	0.124
AVERAGE			0.116

Using the average annual mainline train accident rate for accidents resulting in a release of hazardous materials combined with the estimated annual outbound train miles for RJCP's anticipated operations over the proposed rail line, OEA was able to calculate an annual probability of occurrence and return year interval for a mainline train accident that would result in a release of hazardous materials specific to RJCP's proposed rail line. OEA again decided to use the 20-mile project length of the Proposed Action instead of the 19-mile project length of the Modified Proposed Action in order to capture the "worst-case scenario" from an annual outbound mileage perspective. Table B-6 shows the data used in the calculations, as well as the calculation results.

TABLE B-6
ESTIMATED ANNUAL TRAIN ACCIDENT RATE
FOR ACCIDENTS THAT WOULD RESULT IN A RELEASE OF
HAZARDOUS MATERIALS FOR RJCP'S PROPOSED RAIL LINE

2001-2009 Average Annual Mainline Train Accident Rate For Accidents that Would Result in a Release of Hazardous Materials Per Million Train Miles for Class III Railroad Operators	0.116
Estimated RJCP Outbound Train Mileage Per Year (1 train/day @ 20 miles/outbound trip @ 312 days/year)	6,240
Estimated RJCP Annual Train Accident Rate for Accidents that Would Result in a Release of Hazardous Materials	0.0007 (0.07%)
Estimated RJCP Train Accident Return Year Interval for Accidents that Would Result in a Release of Hazardous Materials	1,428

Based on the data, OEA has calculated a 0.0007 (0.07%) annual probability of occurrence for a mainline train accident that would result in a release of hazardous materials on the proposed rail line. This annual probability of occurrence would equal an estimated return year interval of one accident that would result in a release of hazardous materials every 1,428 years. Thus, there is little likelihood that a mainline train accident resulting in a release of hazardous materials would occur on the proposed rail line. OEA notes that the planned 25 mph maximum operating speed for the proposed rail line likely would further reduce the probability of an occurrence.

ENVIRONMENTAL IMPACTS OF A HAZARDOUS MATERIALS RELEASE

OEA's final step in the risk assessment process was to evaluate the potential environmental impacts and safety consequences that would be associated with a release of ethanol into the project area. To complete this evaluation, OEA relied on the affected environment information presented in Chapter 3 of the DEIS. Ethanol is a polar/water soluble liquid that is flammable. Accordingly, it is important that any large spill of ethanol be accompanied by an immediate evacuation of all persons 1,000 feet downwind of the spill site because of public health and safety concerns. In the case of a spill involving a fire, the evacuation should be expanded to include all persons within one-half mile (in every direction) of the accident site.⁴ OEA used these recommended evacuation distances for the land area potentially affected by a major release of ethanol. The environmental impacts associated with a release of a large volume of ethanol into a stream or river would likely extend beyond the one-half mile fire evacuation zone.

In general, if ethanol were released on land, standard USEPA recommended spill control and countermeasure responses, found at 40 C.F.R. § 112, would include constructing a holding area (pit, pond, etc.) or a dike (soil, sand bags, foamed polyurethane, or foamed concrete) to contain the liquid. If surface waters were impacted, the use of natural barriers or control booms to limit spill travel could also be implemented. If ethanol were released into the soil or water, it should readily biodegrade (breakdown) and would not be expected to significantly bioaccumulate (increase in concentration). If ethanol were released into the atmosphere, it should photodegrade (breakdown) within hours in polluted urban areas and within an estimated range of four to six days in less polluted areas.⁵

The potential environmental impacts and safety consequences associated with a release of ethanol would vary depending upon several factors, including the location of the release (i.e., developed area or undeveloped area), the nature of the release (i.e., land spill or water spill or both), the magnitude of the release, how well the release was contained, and if the ethanol was ignited or not. If a release were to occur in an undeveloped area (such as the Eastern Segment of the proposed rail line) with effective containment measures and without fire or ethanol entering into surface water, the adverse effect would likely be minimal due to the biodegradable and photodegradable characteristics of ethanol. Apart from localized vegetation and soil impacts, such an event would likely have little to no long-term environmental effects. If, however, a release were to occur in a developed area (i.e., certain sections of the Western Segment of the Proposed Action or Modified Proposed Action), and the ethanol ignited or spilled directly into surface water, the adverse effects would be noticeably

⁴ USDOT 2008, Emergency Response Guidebook: A Guidebook for First Responders during the Initial Phase of a Dangerous Goods/Hazardous Materials Transportation Incident, 200-201.

⁵ Howard, P. H. 1990, Handbook of Environmental Fate and Exposure for Organic Chemicals, 222-226.

greater. A release in a populated area would result in the evacuation of people, potential health and safety concerns, and potential property damage.

An accident involving a release of ethanol directly into surface water would likely result in the death of some aquatic organisms for a particular distance downstream. The distance of downstream impact would depend on a number of factors, including the volume of ethanol entering the watercourse (any flowing body of water), the rate at which the ethanol enters the watercourse, and the dilution potential of that watercourse (i.e., smaller streams with less dilution potential would have a greater downstream impact). A worst-case scenario would involve an uncontained release of a large volume of ethanol or an explosive release of ethanol in a highly urbanized area. Such an event could result in human health and safety impacts up to and including destruction of personal property, and even death. The following sections summarize the potential impacts of a release of ethanol by individual resource category.

Land Use

As noted above, the potential environmental impacts and safety consequences associated with a release of ethanol into the project area would be controlled by the location of the release. A release of ethanol within the Western Segment of either the Proposed Action or the Modified Proposed Action would have a substantially greater impact on land use than a release of ethanol within the Eastern Segment. This is due to the substantial differences in land use that exist between the Eastern Segment and both alternatives for the Western Segment. In general, a release of ethanol within the Western Segment of the Proposed Action or the Modified Proposed Action would have a greater potential to impact developed land uses (i.e., residential, commercial, and industrial), whereas a release of ethanol within the undeveloped Eastern Segment would have virtually no potential to impact these types of land uses. A release of ethanol within the Eastern Segment would have a greater potential to impact biological resources, as discussed further below.

Potential impacts of a release of ethanol would also differ along both alternatives of the Western Segment. For example, as noted in Section 4.2 of the DEIS, the Modified Proposed Action's Alternate Route from Philipsburg to Munson is much less developed from a land use perspective than the Proposed Action's Wallaceton to Munson Route. Significant differences in adjacent residential properties exist between these two routes (i.e., 147 versus 20). Additionally, approximately 26,863 linear feet (or 76%) of the Modified Proposed Action's Alternate Route from Philipsburg to Munson is located adjacent to undeveloped land consisting of a combination of wetlands, woodlands, and active/former mining areas. Therefore, a release of ethanol along the Modified Proposed Action's Alternate Route from Philipsburg to Munson would have a lower potential to impact developed land uses than a release along the Proposed Action's Wallaceton to Munson Route.

Impacts to developed land uses are significant because they are typically associated with people. A train derailment resulting in a release of ethanol in a residentially developed area (i.e., Wallaceton, Morrisdale, Allport, Munson, Hawk Run, Winburne) would likely involve some degree of property damage (i.e., impacts to landscaping/vegetation), potential health and safety concerns (i.e., eye, skin, and respiratory tract irritation), and difficulties to citizens caused by the implementation of mandatory evacuation procedures until the spill is cleaned up. In a worst-case scenario involving an uncontained release of a large volume of ethanol or an explosive release of ethanol in a residential

area, potential health and safety impacts could be significant or even life-threatening. However, as discussed above, the risk of any release, let alone a significant release of ethanol on this proposed line is not high, the characteristics of ethanol make it likely that the effects of the release would not be long term, and existing federal regulations and containment procedures are in place to minimize the risk that exists. Thus, an uncontained release of a large volume of ethanol or an explosive release of ethanol in a residential neighborhood in the project area is unlikely.

Biological Resources

Similar to land use impacts, the potential impacts to biological resources (i.e., wildlife and habitat) associated with a release of ethanol would depend on the location of the release. As noted above, an ethanol release within the Eastern Segment or within the Modified Proposed Action's Alternate Route from Philipsburg to Munson would have a greater potential to impact biological resources than an ethanol release within the Proposed Action's Wallaceton to Munson Route. This is due to the more undeveloped setting and the greater biological diversity of these areas.

The adverse effect on biological resources of a small release or a larger release that is effectively contained by hazardous materials response crews would likely be minimal due to the biodegradable and photodegradable characteristics of ethanol discussed above. Apart from localized vegetation and soil impacts, such an event would likely have little to no long-term environmental effects. Conversely, a significant release of ethanol in an undeveloped area would likely result in more severe impacts to biological resources, including death of certain localized plants and animals. The degree of impact would depend on the amount of ethanol that was released into the environment and the ability of hazardous materials response crews to contain the release. In a worst-case scenario, a large volume of ethanol released into the environment and ignited, with little to no containment, could result in a wildfire that extends beyond the immediate ethanol impact area. A large-scale release of ethanol that does not ignite would likely kill plants in the saturated soil area. However, the effects would not be long-lasting due to the rapid oxidation (breakdown) of ethanol discussed above.

Water Resources

Any accident that results in the release of a hazardous material into a surface water resource (i.e., creek, stream, river, etc.) is a serious environmental issue. The severity of the impact of these types of accidents is directly dependent upon the chemical characteristics and physical properties of the particular hazardous material and the amount of the hazardous material that is released. Non-soluble hazardous materials that are denser than water (i.e., sink below the water column) can be very detrimental to aquatic organisms and difficult to remediate. Ethanol is not one of those types of hazardous materials, however. As the discussion above explains, ethanol is soluble and easily diluted in water. In other words, the chemical bonds that hold ethanol together are easily broken in water, allowing the individual molecules of ethanol to readily disperse throughout the water column. Nonetheless, in the unlikely event that a significant volume of ethanol was to spill directly into a watercourse, it could result in the death of some aquatic organisms in the area. The distance of potential downstream impacts on water resources would depend on a number of factors, including the volume of ethanol entering the water, the rate at which the ethanol enters the water, and the dilution potential of that water (i.e., smaller streams with less dilution potential would have a greater downstream impact). Apart from the initial shock to the aquatic system (and the subsequent death of some aquatic organisms), no long-term adverse effects would be anticipated because once

the spill is contained and ethanol is no longer entering the watercourse, the ethanol would quickly flush downstream and become diluted as additional tributary streams contribute to the water flow of the particular watercourse. This impact would, to some degree, be minimized if the ethanol were entering water already impacted by acid mine drainage from surface and subsurface coal mining.

The physical properties of ethanol allow it to quickly biodegrade when released into the environment. Ethanol is soluble in water and is reported as having a half-life under anaerobic conditions of 1 to 4.3 days. This rate of degradation suggests that ethanol would present only a limited risk to contaminate groundwater in the event of release caused by rail operations. Additionally, the extent of groundwater contamination would be limited by the permeability of the underlying bedrock geology (i.e., how easily or quickly a liquid passes through a layer of rock). A rock layer having low permeability would inhibit groundwater contamination. However, if a significant volume of ethanol were to be released into the environment without effective containment measures, the possibility for groundwater contamination could exist. Nevertheless, given the chemical properties of ethanol, any groundwater contamination should naturally remediate in a relatively short time period. Moreover, in the case of a significant groundwater contamination event, chemical oxidation could be used as a means to treat the contaminated groundwater.⁶

Socioeconomics

From a socioeconomic perspective, a train derailment or other event resulting in a release of ethanol would require the services of local and regional emergency response service providers, including hazardous materials response crews. Such an event would result in an increased demand on emergency response crews. However, given the low probability of occurrence, this increased service demand would be minimal and within the operational capacity of existing local and regional emergency response service providers. Additionally, RJCP has its own Derailment Services Division stationed in Pittsburgh, Pennsylvania, to handle any and all derailment and emergency management incidents, including hazardous materials spills, on a 24/7 basis.

Geology and Soils

Apart from the potential vegetation impacts mentioned above, the geology and soil impacts associated with a release of ethanol would be relatively minor because of the biodegradable and water soluble characteristics of ethanol. If ethanol does enter the soil or underlying geology, it would likely biodegrade within a relatively short time period given its reported half-life.

HAZARDOUS MATERIALS TRANSPORTATION SAFETY REQUIREMENTS

The transportation of hazardous materials is regulated by the U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration. These regulations are found at 49 C.F.R. § 100-180. Regulations specific to the transportation of hazardous materials by rail are found at 49 C.F.R. § 174. Special handling requirements for Class 3 flammable liquids, such as ethanol, are

⁶ Chemical oxidation is a pollution treatment technology in which an oxidant, such as hydrogen peroxide (H₂O₂), ozone (O₃), or permanganate (MnO₄), is introduced into a contaminated substance (i.e., soil, groundwater, etc.) to react with contaminants such as MTBE, other fuel oxygenates, and other organic compounds, converting them to innocuous products, such as carbon dioxide and water. USEPA 2004, Technologies for Treating MTBE and Other Fuel Oxygenates, 4-34.

found at 49 C.F.R. § 174.300. NS has incorporated these federal regulations into its United States Hazardous Materials Instructions for Rail (HM-1), which RJCP would be required to comply with. These regulations mandate certain operational procedures and safety requirements specific to the transportation of hazardous materials by rail. They include requirements for hazardous materials documentation (i.e., shipping papers, emergency response information, and location of hazardous materials cars within the train), rigorous inspections of hazardous material rail cars, placarding and marking of rail cars, placement within the train, emergency response procedures, and rail car construction/maintenance. The follow two requirements are specific to the transport of Class 3 flammable liquids:

- Class 3 (flammable liquid) materials may not be loaded, transported, or stored in a rail car equipped with any type of lighted heater or open-flame device, or in a rail car equipped with any apparatus or mechanism utilizing an internal combustion engine in its operation.
- When train length permits, rail cars containing Class 3 flammable liquids must not be nearer than the sixth car from an engine or any occupied caboose, shoving platform, or passenger car. If length does not permit, those cars must be near the middle of the train, but never next to an engine or any occupied caboose, shoving platform, or passenger car.

A full copy of NS's United States Hazardous Materials Instructions for Rail (HM-1) containing all of the applicable hazardous materials transportation safety requirements is attached to this Appendix.

SUMMARY/CONCLUSIONS

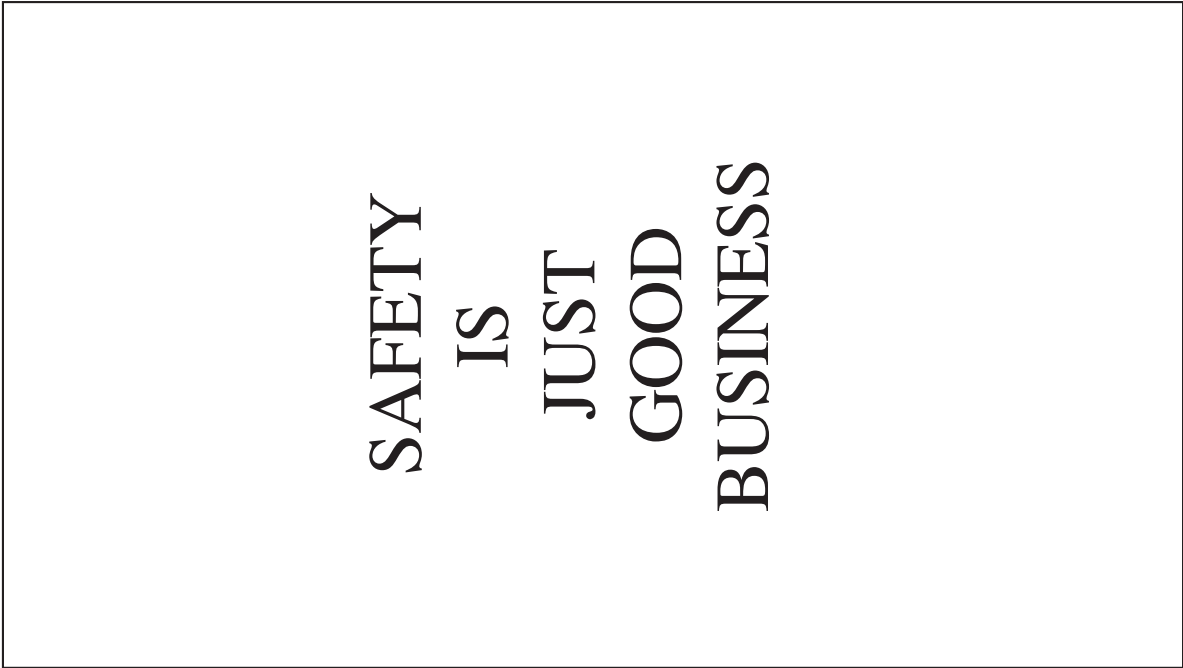
Based on the information presented above, OEA has concluded that an ethanol spill along the Proposed Action would have a greater potential to impact people, whereas an ethanol spill along the Modified Proposed Action would have a greater potential to impact the natural environment (i.e., biological resources, water resources, etc.). This would result from the notable differences in land use between the Western Segment's two alternate routes to Munson. Impacts of a spill on the natural environment would, of course, also be undesirable. But potential impacts to people are generally considered more significant than potential impacts to natural resources. Therefore, a train accident resulting in a release of ethanol on the Proposed Action's Western Segment would generally be more significant than a train accident resulting in a release of ethanol on the Modified Proposed Action's Western Segment. In addition, OEA has concluded that the significantly greater number of grade crossings associated with the Proposed Action compared to the Modified Proposed Action (i.e., 17 versus 4) would likely increase the probability of occurrence of a train accident for the Proposed Action.

An ethanol spill associated with the Local Road System Upgrade alternative would have impacts similar to those caused by a spill along the proposed rail line. A vehicular accident involving a release of ethanol in an urban area would have a greater potential impact on people, whereas a vehicular accident involving a release of ethanol in a more rural area would have a greater potential impact on natural resources. The primary differences would be the significantly greater statistical probability for such an event to occur (i.e., vehicular accidents occur far more frequently than train

accidents) and the significantly lower volume of ethanol likely to be released (i.e., a single truck can carry approximately 15% of the load of a single railroad tanker car).

The No-Action Alternative would have no environmental impacts or safety consequences related to a release of ethanol.

Based on the analysis, OEA has determined that the statistical probability of occurrence for a train accident resulting in a release of ethanol into the project area would be extremely low. OEA calculated a 0.0007 (0.07%) annual probability of occurrence for a mainline train accident that would result in a release of hazardous materials on the proposed rail line. This annual probability of occurrence would equal an estimated return year interval of one accident resulting in a release of hazardous materials every 1,428 years. The planned 25 mph maximum operating speed for the proposed rail line likely would further reduce the probability of an occurrence. Existing federal regulations and containment procedures are in place to minimize this risk of an occurrence, and emergency response service providers are available in the project area to remediate possible damage in the event of a spill. Additionally, ethanol's ability to biodegrade (breakdown) quickly when released into the environment makes it unlikely that the effects of a release would be long term. Therefore, OEA has determined that RJCP's planned transport of ethanol is within an acceptable range of risk for rail transportation of hazardous material. OEA has also concluded that the Modified Proposed Action would be the environmentally preferable alternative from a hazardous materials risk/exposure/impact perspective.



 The logo for the United States, featuring a stylized eagle with its wings spread, perched on a series of horizontal lines. The letters "US" are prominently displayed to the right of the eagle.	UNITED STATES	Hazardous Materials Instructions for Rail	HM-1
			Effective 04/01/09

UNITED STATES		
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RAILROAD SPECIAL HAZMAT INSTRUCTIONS	
NORFOLK SOUTHERN CORPORATION	
1. GENERAL REQUIREMENT	These rules govern all employees of Norfolk Southern Corporation (NS) and its railroad subsidiaries. On the effective date all employees must transport and handle hazardous materials in compliance with the <u>United States Hazardous Materials Instructions for Rail (HM-1)</u> .
2. APPLICABILITY TO FOREIGN LINES	Foreign line carriers with trackage rights on NS are governed by the <u>United States Hazardous Materials Instructions for Rail</u> . If the foreign line railroad has adopted and issued a comparable document containing the <u>United States Hazardous Materials Instructions for Rail</u> , foreign line employees are not required to maintain and have accessible while on duty a current copy of the NS version of the document. NS employees when operating on a foreign railroad are not required to have a copy of the foreign line hazardous materials manual if the foreign line carrier is governed by the <u>United States Hazardous Materials Instructions for Rail</u> .
3. EFFECTIVE DATE	These instructions take effect 12:01 AM, Eastern Standard Time, Wednesday, April 1, 2009. They supersede all previous rules and instructions inconsistent herewith. Further instructions may be issued by proper authority. S. C. Tobias Vice Chairman and Chief Operating Officer Norfolk Southern Corporation
NORFOLK SOUTHERN VISION	<i>Be the safest, most customer-focused and successful transportation company in the world.</i>

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INTRODUCTION	
1. PURPOSE One of the rail industry's primary focuses continues to be the safe transportation of hazardous materials. Rail employees interact regularly with employees of other railroads. If subscribing railroads implement and consistently apply a standard set of rules and regulations, we will significantly enhance both our employees' safety and the safety of the communities through which we operate. Those railroads involved in developing the United States Hazardous Materials Instructions for Rail worked together to create these instructions for employees who transport hazardous materials.	1
2. POLICY To handle hazardous material shipments or incidents safely and efficiently, without delay, and in accord with local, state, and federal regulations, it is imperative that you familiarize yourself with the United States Hazardous Materials Instructions for Rail , in addition to other operating rules. These instructions provide guidance on how to perform your duties so that both you and the company will comply with Department of Transportation (DOT) regulations. Transportation employees who inspect or transport hazardous material by rail must have a copy of and comply with the United States Hazardous Materials Instructions for Rail . Employees who transport hazardous materials must also have a copy of the current Emergency Response Guidebook (ERG) readily accessible while on duty. The company will provide appropriate training to each employee who directly affects hazardous material transportation safety. Always keep in mind that the company requires you to comply fully with the law. Compliance with the letter and spirit of our obligations is good corporate citizenship and is basic to achieving quality in all areas of our operations. Each of us has a duty to see that the railroad's actions are consistent with the highest legal and ethical standards.	1
3. QUESTIONS For questions about the United States Hazardous Materials Instructions for Rail , contact your immediate supervisor.	1

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SECTION 1 — GENERAL INFORMATION	
1. DEFINITION OF HAZARDOUS MATERIALS a. Hazardous materials are defined as "a substance or material which the Secretary of Transportation has determined to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce." b. Hazardous materials are classified according to their chemical and/or physical properties. There are two worded classes and nine numeric classes, some of which may be divided into divisions. A hazardous material is assigned to only one class, even if it meets the definition of more than one hazard class. Table 1 lists the hazard classes and divisions. c. The term "hazardous material" includes hazardous substances, hazardous wastes, elevated temperature materials (HOT or MOLTEN), and marine pollutants.	2
TABLE 1. HAZARD CLASSES AND DIVISIONS	
Numbered Classes and Divisions	
1 — Explosives 1.1 — Explosive with mass explosion hazard 1.2 — Explosive with projection hazard 1.3 — Explosive with predominantly fire hazard 1.4 — Explosive with no significant blast hazard 1.5 — Very insensitive explosive; blasting agent 1.6 — Extremely insensitive detonating substance	
2 — Gases 2.1 — Flammable gas 2.2 — Non-flammable, nonpoisonous, (nontoxic) compressed gas 2.3 — Poisonous (toxic) gas (by inhalation)	
3 — Flammable Liquids	
4 — Flammable Solids and Reactive Solids/Liquids 4.1 — Flammable solid 4.2 — Spontaneously combustible material 4.3 — Dangerous when wet material	
5 — Oxidizers and Organic Peroxides 5.1 — Oxidizer 5.2 — Organic peroxide	
6 — Poisonous (Toxic) Materials and Infectious Substances 6.1 — Poisonous (toxic) material 6.2 — Infectious substance	
7 — Radioactive Materials	
8 — Corrosive Materials	
9 — Miscellaneous Hazardous Materials	
Worded Classes	
Combustible Liquid ORM-D (Other Regulated Materials) (Regulated in air transportation only.)	

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2. GENERAL DOT REQUIREMENT

- a. No person may offer, accept, or transport a hazardous material in commerce unless that material is properly classed, described, packaged, marked, labeled, and placarded and is in proper condition for transportation according to DOT and/or International regulations.
- b. No person may transport a hazardous material in commerce unless the hazardous material is handled and transported according to DOT regulations.

3. EXPEDITING HAZARDOUS MATERIAL SHIPMENTS

- a. All loaded hazardous material shipments and residue/empty time-sensitive hazardous material shipments (see **Table 2**) must be forwarded towards the destination serving yard or applicable interchange as follows:

- (1) within 48 hours (excluding Saturdays, Sundays, and holidays) after accepting them at the shipper's facility or receiving them in any yard, intermediate (transfer) station, or interchange point;
- or
- (2) when less than 5 day week service is performed, on the first available train toward the destination.
- EXCEPTION:** The 48 hour rule does not apply to shipments that are constructively placed or set out for repair.

TABLE 2. TIME-SENSITIVE SHIPMENTS

(1) Chloroprene, Stabilized	UN1991
(2) Ethylene, Refrigerated Liquid	UN1038
(3) Flammable Liquid, N.O.S. (Methyl Methacrylate Monomer, Uninhibited)	UN1993
(4) Flammable Liquid, N.O.S. (Recycled Styrene)	UN1993
(5) Styrene Monomer, Stabilized	UN2055
(6) Hydrogen Chloride, Refrigerated Liquid	UN2186
(7) Hydrogen, Refrigerated Liquid	UN1966
(8) Vinyl Fluoride, Stabilized	UN1860

- b. All Toxic Inhalation Hazard (TIH) shipments identified in **Table 3** must be delivered into the customer's facility at the next available switch after the TIH shipments have arrived in the railroad's yard at final destination.
- If delivery cannot take place, Central Yard Operations (CYO) must be notified immediately with the reason for failure, and an alternative switching schedule, when applicable, must be scheduled.

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TABLE 3. TOXIC INHALATION HAZARD (TIH) SHIPMENTS

(1) Acetone Cyanohydrin, Stabilized	UN1541
(2) Allyl Alcohol	UN1098
(3) Anhydrous Ammonia	UN1005
(4) Bromine	UN1744
(5) Chlorine	UN1017
(6) Chloropicrin	UN1580
(7) Chlorosulfonic Acid	UN1754
(8) Dimethyl Sulfate	UN1595
(9) Ethyl Chloroformate	UN1182
(10) Ethylene Oxide	UN1040
(11) Hexachloropentadiene	UN2646
(12) Hydrogen Chloride, Refrigerated Liquid	UN2186
(13) Hydrogen Cyanide, Stabilized	UN1051
(14) Hydrogen Fluoride, Anhydrous	UN1052
(15) Hydrogen Sulfide	UN1053
(16) Methyl Bromide	UN1062
(17) Methyl Mercaptan	UN1064
(18) Phosphorous Trichloride	UN1809
(19) Sulfur Dioxide	UN1079
(20) Sulfur Trioxide, Stabilized	UN1829
(21) Sulfuric Acid, Fuming	UN1831
(22) Titanium Tetrachloride	UN1838
(23) Toxic By Inhalation Liquid, Corrosive, N.O.S.	UN3390
(24) Toxic By Inhalation Liquid, Flammable, N.O.S.	UN3394

4. EXCEPTIONS FOR U.S. GOVERNMENT MATERIAL

- a. Department of Energy (DOE) and Department of Defense (DOD) shipments made for the purpose of national security and accompanied by escorts (personnel specifically designated by or under the authority of DOD or DOE) are **not** subject to DOT regulations or to the instructions in this book.
- b. Escorts must travel in a separate transport vehicle from the rail car carrying the hazardous materials.
- c. The escorts must have, in their possession, a document certifying that the shipment is for the purpose of national security.

5. INTERNATIONAL SHIPMENTS

International shipments of hazardous materials (including shipments to and from Mexico and Canada), moving with proper international documents and international placards, may be transported in the United States (U.S.):

- a. From a U.S. port of entry to their U.S. destination.
- b. When moving through the U.S. to a foreign destination.
- c. From a U.S. point of origin to the International port of entry, when the cars are:
- (1) returning residue shipments;
 - or
 - (2) regulated internationally but not in the U.S.

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SECTION 2 — REQUIRED DOCUMENTATION

1. GENERAL REQUIREMENTS

No person may accept a hazardous material for shipment by rail transportation or transport a hazardous material in a train unless a member of the crew has each of the following documents:

- Acceptable shipping papers.
- Acceptable emergency response information.
- A document showing the current position of the hazardous material shipment in the train.

NOTE: The purpose of this documentation is to provide railroad personnel and emergency response personnel with accurate information about the hazardous materials.

Therefore, keep all current hazardous material documents neat and orderly and ensure that they are available in case of an emergency or for inspection. Properly discard superseded documents to eliminate the possibility of confusing or inconsistent information.

2. ACCEPTABLE SHIPPING PAPERS

Any one of the following documents is an acceptable shipping paper for hazardous material shipments, as long as it includes the required shipping description entries (see **Item 6** of this section), is legible, and is printed (manually or mechanically in English).

- Railroad-produced documents** — for example, train consists, train lists, wheel reports, waybills, industry work orders, or other similar documents.
- Customer-produced documents** — for example, bills of lading [including United Parcel Services (UPS) hazardous materials packets], or switch lists.
- A **connecting carrier's documents**.
- A **hand-printed document** (printed, not cursive letters) — for example, radio waybills.
- A **hazardous waste manifest**.

3. ACCEPTABLE EMERGENCY RESPONSE INFORMATION

Any one of the following documents is acceptable emergency response information:

- Emergency response information printed as part of the train list/consist.
- Emergency Response Guidebook** (ERG).
- Similar information provided by the customer — for example, a Material Safety Data Sheet (MSDS).

4. DOCUMENT INDICATING POSITION-IN-TRAIN

Before moving hazardous material shipments in a train, a member of the crew must have a document that shows the current position in the train of each hazardous material shipment (loaded and residue/empty).

When making pickups or setouts, update the document before proceeding. The train crew may update the document by handwriting on it or by appending or attaching another document to it.

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5. CHECKING FOR SHIPPING PAPERS

Make sure that a member of the crew has a paper copy of acceptable shipping papers, with the required entries, for each hazardous material when:

- Accepting hazardous material shipments at a customer's facility, interchange point, or other location.
- Moving hazardous material shipments in a train.
- Delivering hazardous material shipments to a customer's facility, interchange point, or other setout point.
- Switching hazardous material shipments outside a yard.

NOTE: Shipping papers are not required in the switch crew's possession when moving hazardous material shipments within a yard or at a customer's facility.

EXCEPTION: Although they may remain placarded and marked, residue/empty "Elevated Temperature Material" tank cars do not require hazardous material shipping papers and emergency response information.

6. REVIEWING SHIPPING PAPER ENTRIES

Review the shipping description entries for each hazardous material on the shipping papers and make sure that the following entries (a–g under this item) are present. (**Figure 1** shows two formats for displaying the shipping description entries.)

FIGURE 1. SHIPPING DESCRIPTION ENTRIES

Vertical Format

GATX 12345 ^(a)
 1/TC ^(b)
 SULFURIC ACID ^(c)
 8 ^(d)
 UN1830 ^(e)
 PGI ^(f)
 RQ (SULFURIC ACID) ^(g)
 EMERGENCY CONTACT: 800-424-9300 ^(h)
 HAZMAT STCC = 4930040 ⁽ⁱ⁾⁽¹⁾

Horizontal Format

UTLX 12345 ^(a)
 1/TC ^(b) // CHLORINE ^(c) // 2,3 ^(d) // UN1017 ^(e) // RQ (CHLORINE) ^{(g)(3)} //
 POISON-INHALATION HAZARD ^(h) // ZONE B ⁽ⁱ⁾⁽⁷⁾ // MARINE POLLUTANT
 (CHLORINE) ^{(h)(4)} // EMERGENCY CONTACT: 800-424-9300 ^(h) //
 HAZMAT STCC = 4920523 ⁽ⁱ⁾⁽¹⁾

Items (a) through (g) are required entries for the basic hazardous materials description. Item (h) refers to additional entries that may appear. Typically, items (b) through (f) are in the sequence shown; however, certain items (technical name and subsidiary hazard class) may appear in parentheses between items (b) through (f). **NOTE:** The identification number (e) may be found either before the proper shipping name (c) or after the hazard class (d) until January 1, 2013 when the identification number must appear before the proper shipping name (c).

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a. Reporting Marks (Initials) and Number The shipping paper for a rail car, freight container, transport vehicle, or portable tank must include the reporting mark and number only when the reporting mark and number are displayed on the rail car, freight container, transport vehicle, or portable tank. b. Total Quantity Notation (1) For empty packagings, bulk packagings, or cylinders of Class 2 materials, some indication of the total quantity must be shown (certain abbreviations are acceptable). For example, "1 T/C" (1 tank car), "1 CYL" (1 car load), or "10 CYL" (10 cylinders). (2) For non-bulk packaging, the total quantity is given by both: (a) weight or volume (including the unit of measure); for example, "100 lbs.," "55 gal.," "5 kg," or "208 L"; and (b) number and type of packages; for example, "12 drums," "12 UN 1A1," "15 4G," or "2 UN 3H1 JERRICAN." (3) For Class 1 materials, the quantity shown must be the Net Explosive Mass. See 49 CFR, Section 172.202(a)(5)(i). c. Proper Shipping Name (1) The proper shipping name of the hazardous material may be one or more words, such as "Chlorine" or "Sulfuric Acid." The proper shipping name may include a number that indicates the concentration of the material. (2) When a N.O.S. (Not Otherwise Specified) shipping name appears, the technical name of the product may appear in parentheses immediately after the N.O.S. shipping name, such as "Corrosive Liquid, N.O.S. (Capryl Chloride)." (3) Residue/empty tank car shipments must begin with "Residue: Last Contained," followed by the proper shipping name. (4) For waste shipments, the word "Waste" will precede or be part of the proper shipping name of the material. d. Hazard Class Reference: For further information on hazard classes, see the definition in the Glossary and the list of hazard classes and divisions in Table 1. (1) For certain hazardous materials, a subsidiary hazard class, will appear in parenthesis after the primary hazard class. For example, Ethylene Oxide is listed as "2.3 (2.1)". (2) The hazard class need not be repeated for Combustible Liquids, N.O.S. shipments. (3) Classes 1.1, 1.2, 1.3, 1.4, 1.5, and 1.6 may show a compatibility group letter after the class (for example, 1.1A). The letter has no significance in rail transportation.	7	HM-1
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e. Identification Number A 4-digit identification number must appear on the shipping papers with the prefix "UN" (United Nations) or "NA" (North America) as appropriate. NOTE: The identification number (e) may be found either before the proper shipping name (c) or after the hazard class (d) until January 1, 2013 when the identification number must appear before the proper shipping name (c). EXCEPTION: The proper shipping description "gas generator assemblies for aircraft" does not require identification numbers. f. Packing Group The packing group must appear on the shipping papers in Roman numerals ("I," "II," or "III"). The packing group may be preceded by the letters "PG" ("PGI," "PGII," or "PGIII"). EXCEPTIONS: Hazard Classes 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 2.1, 2.2, 2.3, 4.1 (self-reactive liquids or solids, types B–F), 5.2, 6.2, 7, and ORM-D do not require the packing group notation. g. Emergency Response Telephone Number Shipping papers for hazardous materials must show a 24-hour emergency response telephone number. This number must include the area code or international access code. EXCEPTIONS: Emergency response telephone numbers are not required when the hazardous material is shown as a "Limited Quantity," "LTD QTY," or its shipping name is: (1) Battery powered — equipment or vehicle. (2) Carbon dioxide, solid or dry ice. (3) Castor — bean, meal, flake, or pomace. (4) Consumer commodity. (5) Engines, internal combustion. (6) Fish — meal or scrap, stabilized. (7) Refrigerating machine. (8) Wheelchair, electric. (9) Vehicle, flammable gas powered or vehicle, flammable liquid powered. (10) Fumigated unit. h. Additional Entries Some hazardous material shipping descriptions also may require one or more of these entries: (1) "Residue: Last Contained ..." (for packages emptied to the maximum extent possible). (2) "HOT" notation added before a proper shipping name for elevated temperature materials. (3) "RQ" for Reportable Quantity notation of a hazardous substance. (4) "MARINE POLLUTANT" notation. (5) "POISON" or "TOXIC" notation. (6) "POISON (TOXIC)-INHALATION HAZARD (PIH or TIH)" or "INHALATION HAZARD (IH)" notation.	8	HM-1
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(7) Hazard Zone notation ("ZONE A," "ZONE B," "ZONE C," or "ZONE D"). (8) "LIMITED QUANTITY" or "LTD QTY" notation. (9) FRA Movement Approval (for example, "FRA 0109123"), DOT Special Permit (for example, "SP 9271"), Special Approval Number (for example, "SA 920403"), or Competent Authority Number (for example, "CA 9701001"). (10) DOT-113 notation ("DOT-113, Do Not Hump or Cut-Off in Motion"). (11) Hazardous Materials Response Code (STCC "48xxxxx" or "49xxxxx"). (12) Certain shipments described using Canadian regulations may contain both an Emergency Response Plan number and its activation telephone number (e.g., "ERP-2-1008 (800-555-5555) // SPECIAL COMMODITY"). (13) Box of asterisks with or without wording (not required by DOT, but may appear on railroad-produced documents). (14) Shipper's Certification. (15) "OIL" notation. (16) Additional radioactive material entries. (17) Name and address of the place of business in Canada of the consignor. (18) Additional hazardous waste shipping description entries (see Section 2, Item 11a). (19) EX number for Air Bag Inflators classified as Class 9. NOTE: recycled Air Bag Modules do not require the EX number entry but must have the words "recycled" after the basic description. (20) For international shipments the following additional information may be present: <i>Dangerous Goods in Excepted Quantities, and an indication of number of packages.</i> NOTE: This information may appear voluntarily on the shipping papers starting January 1, 2009 and becomes mandatory January 1, 2010. 7. HANDLING SITUATIONS WHEN SHIPPING PAPERS OR REQUIRED ENTRIES ARE NOT AVAILABLE When the appropriate shipping paper is not present or when all required entries on the shipping paper provided are not present: a. Do not move the car until the appropriate shipping paper or the required entries on the shipping paper are present. b. Take one of these three actions: (1) Correct the existing document. Contact the customer or your supervisor, request the entries required to complete the shipping description, and legibly print those entries in the appropriate sequence (see Section 2, Item 6). or (2) Obtain the appropriate shipping paper from the shipper, your supervisor, or other appropriate person. or	(3) Use a radio waybill. (a) Contact your supervisor or dispatcher and request the appropriate entries for a radio waybill (see Figure 2, Radio Waybill). The supervisor or dispatcher will provide the requested entries via radio or telephone to you. (b) Complete the radio waybill using the information the supervisor or dispatcher provided. NOTE: If a radio waybill form is not available, legibly print the required hazardous material information on a sheet of paper including the car's initials and number (see Section 2, Item 6). (c) Keep the radio waybill with the other shipping documents until either reaching the final destination or receiving another shipping paper with the appropriate entries. (d) For each radio waybill issued, add the car initial and number and its position on the position-in-train document. 8. CHECKING FOR EMERGENCY RESPONSE INFORMATION a. When accepting and transporting hazardous material shipments, make sure a copy of the emergency response information for each shipment (see Section 2, Item 3) is available. b. If emergency response information is not available, do not accept or transport the car. 9. CHECKING FOR POSITION-IN-TRAIN DOCUMENT a. When transporting hazardous material shipments in a train, make sure a member of the crew has a document indicating the current position in train of each hazardous material shipment. b. If the document indicating the current position in train of each hazardous material is not available: (1) update the documents already in your possession; or (2) create a hand-printed list showing the position in train of each hazardous material shipment. NOTE: The list must show the reporting marks and number for each hazardous material shipment in the train and its actual position in the train. 10. HANDLING SHIPPING PAPERS RECEIVED FROM A CUSTOMER When picking up a hazardous material shipment from the customer and the customer provides the original shipping papers: a. Check for appropriate hazardous material entries. b. For loaded shipments, make sure that the shipper's certification and signature (signature by hand or mechanical means) are on the shipping papers received from the customer.
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FIGURE 2. EXAMPLE OF RADIO WAYBILL

NOTE: Print legibly

HAZARDOUS MATERIAL

1. Train Number _____
 2. Number of Cars from Head End _____
(Update the position-in-train documents)
 3. Car Initial & No. _____
 4. 1/ Car Load or Residue Last Contained (Circle One)
- *** DESCRIPTION OF ARTICLES *****
5. Number of Packages/Car _____
 6. Proper Shipping Name _____
 7. Technical Name (_____)
 8. Primary Hazard Class _____
Secondary Hazard Class _____
 9. UN/NA Id. No. _____
 10. Packing Group (PG): I II III (Circle One)
 11. Reportable Quantity (RQ): (_____)

***** ADDITIONAL INFORMATION *****

12. Poison/Toxic-Inhalation Hazard:
Zone A Zone B Zone C Zone D (Circle One)
 13. Marine Pollutant (_____)
 14. DOT Special Permit Number(s): _____
 15. Additional Information _____
 16. ERP Plan No.: _____
(Canadian Shipments Only)
 17. ERP Telephone No.: (_____) - _____
(Canadian Shipments Only)
 18. Emergency Contact (_____) - _____
(_____) - _____
- Completed: _____
- Date: _____ / _____ / _____ Time: _____ : _____ AM
MO DAY YR

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11. HANDLING HAZARDOUS WASTE SHIPPING PAPERS AND MANIFESTS

a. The shipping paper for a hazardous waste shipment must have the following entries in addition to the entries required for other hazardous material shipments:

- (1) Proper shipping description.
- (2) Name, address, and telephone number of the hazardous waste generator.
- (3) Name and address of the hazardous waste disposal facility.
- (4) Name of transporter.
- (5) Waste manifest number.
- (6) Special handling instructions.

b. Before picking up a rail car containing hazardous waste from a hazardous waste generator, either:

- (1) the shipper/generator will sign the original hazardous waste manifest if they have the authority to sign on behalf of the company;

or

- (2) a member of the train crew, or another designated railroad employee, must sign on behalf of the company in the "Transporter acknowledgment" section of the manifest.

c. When delivering rail cars of hazardous waste to a disposal facility, either:

- (1) the disposal facility has an agreement with the company to forward the signed manifest directly to the Agency Operations Center;

or

- (2) a train crew member or other designated employee must obtain a handwritten signature by a person representing the disposal facility on the manifest or on the shipping paper if the manifest is not available, which then must be forwarded to the Agency Operations Center.

12. HANDLING REQUESTS FOR SHIPPING PAPERS OR EMERGENCY RESPONSE INFORMATION

When receiving a request for shipping papers or emergency response information from a railroad employee, regulatory enforcement officer, or emergency response personnel in an emergency:

- a. share **all** the information on the shipping papers for the shipment; and
- b. share **all** available emergency response information.

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SECTION 3 — CAR INSPECTION 1. GENERAL REQUIREMENTS a. To determine that they are in acceptable condition for transportation, all loaded and residue/empty hazardous material shipments must be inspected at these points: (1) Before accepting them from the shipper. (2) When receiving them in interchange. NOTE: Run-through trains received in interchange may continue to the next inspection point before being inspected. (3) When placing them in a train. (4) At other points where an inspection is required (e.g., 1,000 mile inspection). b. Accept or transport only those hazardous material shipments that conform to these instructions. 2. INSPECTION PROCEDURES From ground level, inspect all rail cars, trailers, and containers transporting hazardous materials, whether loaded or residue/empty (including flat cars transporting placarded or marked trailers or containers), for: • Leakage. • Required placards and markings (including stenciling, car certificates, and qualification dates). • Secure fastening of closures. • Signs of tampering, such as suspicious items or items that do not belong, the presence of an "Improvised Explosive Device" (IED), and other signs that the security of the car may have been compromised. <i>(This inspection must take place from the ground, at a close enough distance so that any problems can be readily identified, and must NOT be performed from a moving vehicle.)</i> NOTE: Where an indication of tampering or a foreign object is found, take the following actions: ○ Do not accept or move the rail car. ○ Immediately move yourself and others to a safe location away from the rail car before using radios and cell phones to make notifications. ○ For cars at a customer's facility, immediately contact local plant personnel. If local plant personnel are not available or cannot explain what you see, immediately contact the Train Dispatcher. ○ For cars on interchange tracks or in the yard, immediately contact the Yardmaster or Train Dispatcher.	HM-1 13
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a. Inspecting All Car Types (from Ground Level) (1) Without climbing on the car, make sure that the hazardous material shipment is not leaking. (a) Look for leaking contents — drips, wetness, or material on the car or on the ground. (b) Look for a vapor cloud. (c) Listen for hissing sounds of the contents escaping. NOTE: If you find a hazardous material shipment leaking, follow the instructions in Item 3 of this section and in Section 8 (Emergency Response), Item 5. (2) Make sure placards and markings are appropriate for the shipment in good condition and displayed correctly (see Section 4, Placards and Markings). (3) Before accepting a hazardous material shipment from the shipper, make sure that: (a) All customer loading and unloading lines are disconnected. (b) Derals, chocks, and blue flags are removed. (c) All platforms are raised or in the clear. b. Inspecting Tank Cars (from Ground Level) Check placarded tank cars or tank cars marked with an identification number to see that: (1) Protective housing covers are closed. (2) Manway cover swing bolts are up and in place. (3) All valves and fittings appear to be closed and secure. (4) Visible plugs or caps (including bottom outlet caps) or other fittings are securely in place. NOTE: Heater coil caps may be left off. c. Inspecting Placarded/Marked Gondola Cars (1) Look for loosely fastened gondola covers. (2) Make sure the cover or tie downs do not foul any safety appliances. d. Inspecting Placarded/Marked Hopper Cars Check that discharge gates are closed and secured. e. Inspecting Placarded/Marked Intermodal Cars (1) Make sure that an intermodal tank container of hazardous materials is not transported with a container above or below the tank. (2) Placards must be fully visible when containers are loaded in a well car. (3) Intermodal tanks must be placed so that any bottom outlet valves are pointed toward the ends of the well car or platform f. Inspecting Shipments Placarded EXPLOSIVES 1.1 or 1.2 (1) In addition to the other inspection requirements in this section, for shipments placarded EXPLOSIVES 1.1 and 1.2: (a) Look for indications of damage to the contents. (b) Make sure that completed "car certificates" (see Figure 3, Car Certificate) are displayed on both sides of the rail car.	HM-1 14
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SECTION 4 — PLACARDS AND MARKINGS

1. GENERAL REQUIREMENT

Hazardous material shipments, whether loaded or containing a residue, must not be accepted for transportation or transported unless they are properly placarded and marked.

2. PLACARD REQUIREMENTS

Each bulk packaging, freight container, transport vehicle, or rail car containing hazardous material must be placarded on each side and each end in accordance with the instructions below.

NOTE: Unless the shipping papers indicate that the shipment is a limited quantity, all international shipments (including Canada and Mexico) of hazardous materials require placards.

PLACARD — a sign measuring 273 mm (10.8 in) by 273 mm (10.8 in) square-on-point, communicating a hazard by symbol, color, and words or numbers. (See **Figure 4** for pictures of placards.) Text indicating the hazard is not required on placards other than the DANGEROUS placard. The hazard class text does not have to be in English.

NOTE: A placard meeting IMDG requirements [minimum of 250 mm (9.8 in) by 250 mm (9.8 in)] is acceptable.

a. Placards are required when transporting **any quantity** of these hazard classes:

- 1.1 Explosive with mass explosion hazard
- 1.2 Explosive with projection hazard
- 1.3 Explosive with predominantly fire hazard
- 2.3 Poisonous (toxic) gas (by inhalation)
- 2.3 Poisonous (toxic) material
- 4.3 Dangerous when wet material
- 5.2 Organic peroxide, Type B, liquid or solid, temperature controlled
- 6.1 Poisonous (toxic) material, inhalation hazard, Hazard Zone A, and Hazard Zone B
- 7 Radioactive Yellow III label or exclusive use shipments of low specific activity (LSA) materials and surface contaminated objects.

b. Placards are required when transporting quantities of 1,001 lbs. (454 kg) or more of these hazard classes:

NOTE: Placards may be displayed for quantities less than 1,001 lbs. of these materials, as long as they are appropriate for the shipment.

- | | |
|-----|--|
| 1.4 | Explosive with no significant blast hazard |
| | NOTE: Placards are not required for Class 1.4S materials. |
| 1.5 | Very insensitive explosive; blasting agents |
| 1.6 | Extremely insensitive detonating substances |
| 2.1 | Flammable gas |
| 2.2 | Non-flammable, nonpoisonous compressed gas |
| 3 | Flammable liquid |
| 4.1 | Flammable solid |

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- (i) Car certificates must be removed after the rail car, trailer, or container is unloaded.
- (ii) Car certificates are either 7.1 by 7.1 inches or 5.9 by 7.9 inches in size.
- (2) Do not accept or transport the car until all damage has been corrected and car certificates are in place.

3. HANDLING DEFECTS

When a hazardous material shipment does not appear to be prepared for transportation or signs of tampering such as suspicious items are found:

- a.** Do not accept or pull the hazardous material shipment or allow it to continue in transportation.
- b.** Notify the customer, Train Dispatcher, Yardmaster, or your immediate supervisor, as appropriate, and explain the problem.

FIGURE 3. CAR CERTIFICATE

Railroad

No. 1 _____ Station, _____, 20 _____

I hereby certify that I have this day personally examined _____

Car Number _____ and that the car is in condition for service _____ and complies with the FRA Freight Car Safety Standards (49 CFR Part 215) and with the Requirements for freight cars used to transport explosives prescribed by the DOT Hazardous Materials Regulations (49 CFR Part 174).

(Qualified Person Designated Under 49 CFR 215.11)

No. 2 _____ Station, _____ 20 _____

I have this day personally examined the above car and hereby certify that the _____

_____ explosives in or on this car, or in or on vehicles or in containers have been loaded and _____

_____ attached; that placards have been applied, according to the regulations prescribed by the _____

_____ Department of Transportation; and that the doors of cars so equipped fit or have been _____

_____ stripped so that sparks cannot enter.

(Shipper or his authorized agent)

(Qualified Person Designated Under 49 CFR 215.11)

No. 3 _____ Station, _____, 20 _____

I hereby certify that I have this day personally supervised the loading of the vehicles or containers on and their securement to the above car.

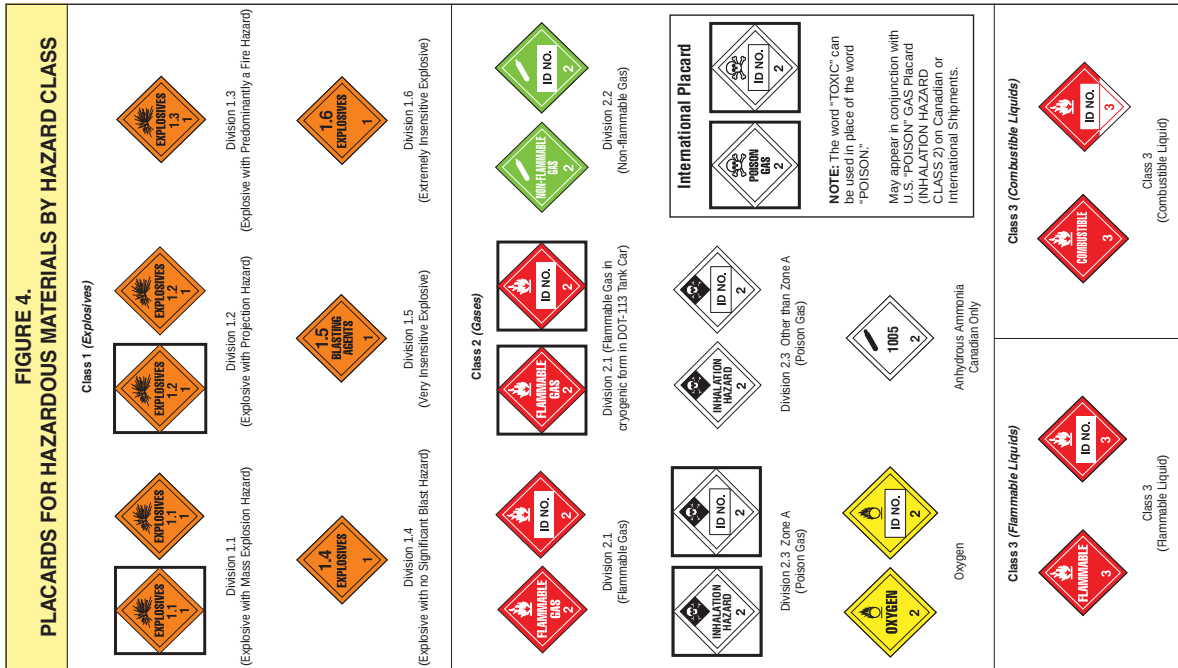
(Shipper or railway employee inspecting loading and securement)

NOTE 1: A shipper must decline to use a car not in proper condition.

NOTE 2: All certificates, where applicable, must be signed.

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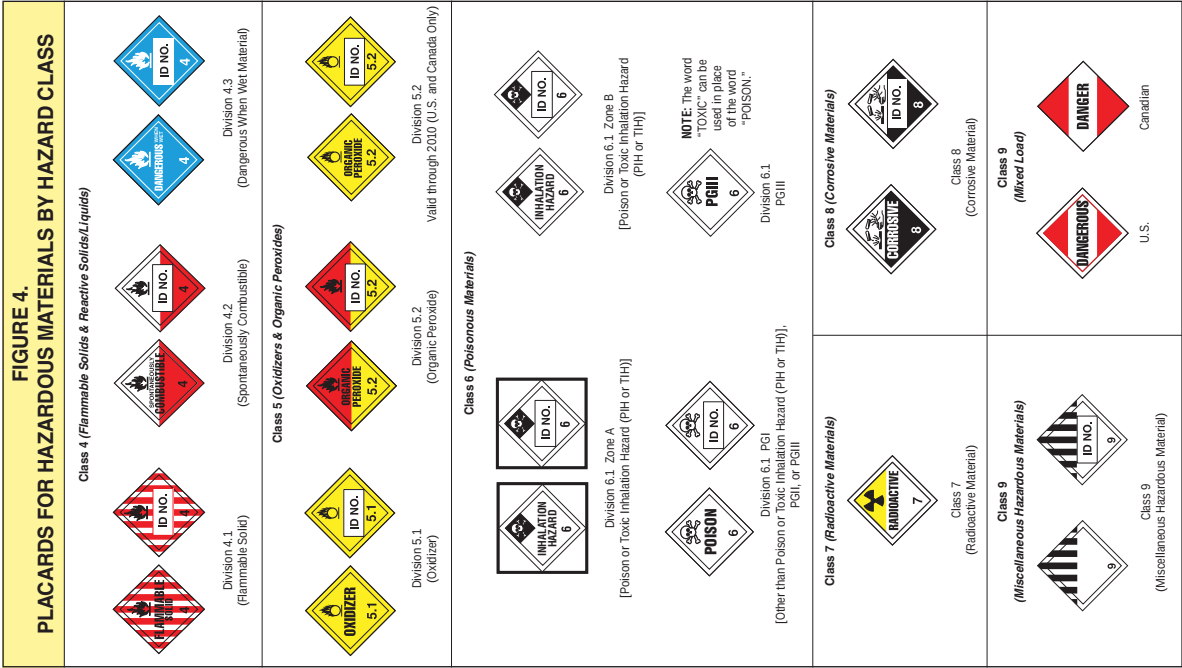
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- 4.2 Spontaneously combustible material
- 5.1 Oxidizer
- 5.2 Organic peroxide, other than "organic peroxide, Type B, liquid or solid, temperature controlled" in 2a above
- 6.1 Poisonous (toxic) material other than materials poisonous (toxic) by inhalation
- 8 Corrosive material
- 9 Miscellaneous hazardous material.
- EXCEPTION:** For U.S./Canadian transportation, Class 9 placards are not required. However, bulk shipments of Class 9 materials must be marked with the identification number (see **Section 4, Item 4**).
- Combustible Liquids
- Mixed hazardous materials in this item.
- NOTE:** For U.S. transportation of Class 6.1, PGIII, a PGIII placard may be used in place of a POISON (TOXIC) placard.
- c. Placards are not required for:
- (1) Hazardous material shipments with less than 1,001 lbs. (454 kg) total weight, provided the hazard classes are included in **Item b** above
 - (2) ORM-D (Other Regulated Materials)
 - (3) Class 6.2 (Infectious Substances)
 - (4) Class 9 (U.S./Canadian) materials that display the identification number
 - (5) Limited Quantity (LTD QTY) shipments when identified as such on shipping papers
 - (6) Cryogenic atmospheric gases, other than Oxygen (for example, Argon)
 - (7) Combustible liquids in non-bulk packaging (i.e., drums), usually found in intermodal shipments, unless the material is a hazardous substance or hazardous waste
 - (8) Rail cars and intermodal tanks which have been cleaned and purged
 - (9) Shipments listed as Radioactive White I and Yellow II labels on shipping papers
 - (10) Class 1.4S
 - (11) Shipments of molten sulfur moving to the United States from Canada, provided the identification number and the words "MOLTEN SULFUR" appear on each side of the tank car.
- d. Placards may be displayed for hazardous materials, even when not required, as long as the placard is appropriate for the contents of the shipment. If displayed, then all instructions for that placard apply.
- e. Certain hazard classes require the display of the primary placard on a white square background, including (see **Figure 4, Placard Chart**) (when required to be affixed to the rail car):
- (1) Hazard Class 1.1 or 1.2 explosives
 - (2) Hazard Class 2.1 Flammable Gases loaded in DOT-113 tank cars
 - (3) Hazard Class 2.3 or 6.1 Poison Inhalation Hazard Zone A material.

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f. The DANGEROUS placard may be used instead of separate placards when a rail car, trailer, or container is loaded with non-bulk packages of two or more classes of hazardous materials from **Item 2b** of this section.

NOTE: When 1,000 kg (2,205 lbs.) or more of one class of material is loaded at one loading facility, the placard(s) for that class as specified in **Item 2b** of this section must also be applied.

g. Some shipments of hazardous materials require subsidiary placards that represent secondary hazards. These placards must not display a 4-digit identification number, but will display the hazard class or division.

NOTE: Subsidiary placards must be displayed when the subsidiary class is 2.3, 4.3, or 6.1 with the notation POISON-INHALATION HAZARD or TOXIC-INHALATION HAZARD present on the shipping papers.

h. For residue/empty hazardous materials shipments, the rail car, trailer, or container must remain placarded in the same manner as the loaded shipment unless the packaging:

- (1) has been cleaned of residue;
- or
- (2) has been purged of vapor to remove any hazard;
- or
- (3) has been refilled, with a material requiring different placards or no placards, to such an extent that any residue remaining in the packaging is no longer hazardous.
- (4) Contains a residue of an elevated temperature. These shipments may remain placarded in the same manner as when it contained a greater quantity of the material even though the material no longer meets the definition for an elevated temperature material.
- (5) Contains a residue of a Hazardous Substance, Class 9, that does not meet the definition of another hazard class and is not a hazardous waste or marine pollutant. These shipments may remain marked, labeled, and or placarded in the same manner as when it contained a greater quantity of the material even though the material no longer meets the definition for a Hazardous Substance.

3. INSPECTING FOR PLACARDS

a. Make sure that all required placards are:

- (1) Consistent with the shipping paper information.
- (2) On both sides and both ends of the shipment.
- (3) In placard holders or securely attached to the rail car, trailer, or container.
- (4) Not damaged, faded — color should be similar to the color printed in this document (see **Figure 4, Placard Chart**), or obscured by dirt or car part.
- (5) Oriented horizontally, so you can read them from left to right.
- (6) Readily visible from the direction they face, except for placards on the ends of trailers and containers in or on a rail car.

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b. When **picking up** a hazardous material shipment at a customer's facility or siding and a placard is not correct, does not meet the standards above, or is missing:

- (1) Notify the customer, Train Dispatcher, Yardmaster, or your supervisor, as appropriate.
- (2) Do **not** accept the hazardous material shipment until corrections have been made.

c. When a placard does not meet the standards above or is discovered missing **en route**, notify the Train Dispatcher, Yardmaster, or your supervisor, as appropriate. They will arrange to correct the problem at the next inspection point.

4. MARKING REQUIREMENTS AND INSPECTING FOR MARKINGS

Marking — a descriptive commodity name, identification number, caution (such as INHALATION HAZARD, HOT, MOLTEN, FUMIGANT, OR NON-ODORIZED (not odorized) or MARINE POLLUTANT), or tank car qualification date displayed on hazardous material shipments.

Make sure the markings above are displayed on bulk packages as follows:

a. Identification Number Mark

- (1) Identification number markings must appear on both sides and both ends either on the placard or in close proximity to the placard, when a placard is required:
 - (a) Bulk packages of hazardous materials (including Class 9 when no placard is required).

NOTE: Identification number markings are not required on the ends of multi-compartmented tank cars transporting more than one hazardous material having different DOT identification numbers.
- (b) Rail cars, trailers, and containers when 8,820 lbs. (4,000 kg) or more of non-bulk packages of hazardous materials, with the same proper shipping name and identification number, are loaded at one location and the transport vehicle does not contain any other hazardous or non-hazardous materials.

EXCEPTION: For shipments of molten sulfur from Canada, the identification number marking must appear only on both sides of the tank car.

(2) Identification numbers can be displayed in one of three ways, as **Figure 5** shows:

FIGURE 5. IDENTIFICATION NUMBERS





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- (3) Identification numbers must not be displayed on:
 - (a) EXPLOSIVES 1.1, 1.2, 1.3, 1.4, 1.5, or 1.6 placards.
 - (b) RADIOACTIVE placards.
 - (c) DANGEROUS placards.
 - (d) Subsidiary placards.
- (4) Make sure that the identification numbers appear as required above and agree with the shipping paper entries.
- (5) When **picking up** a hazardous material shipment at a customer's facility or siding or at an interchange point and the identification number is not correct, is not legible, or is missing:
 - (a) Notify the customer, Train Dispatcher, Yardmaster, or your supervisor, as appropriate.
 - (b) Do **not** accept the hazardous material shipment until corrections have been made.
- (6) When an identification number is not correct, is not legible, or is missing **en route**, notify the Train Dispatcher, Yardmaster, or your supervisor, as appropriate. They will arrange to correct the problem at the next inspection point.

NOTE: Missing identification numbers must be replaced and may be entered on the appropriate placard, orange panel, or white square-on-point configuration by hand using a **black indelible** marker.

b. MARINE POLLUTANT Mark

- (1) For a material described on the shipping papers as a marine pollutant and the shipment does not require a placard, make sure that the MARINE POLLUTANT mark appears on both sides and both ends of bulk packagings in one of the formats in **Figure 6**.

FIGURE 6. MARINE POLLUTANT MARK





NOTE: MARINE POLLUTANT marks are not required when the bulk packaging displays a placard.

- (2) When **picking up** a hazardous material shipment at a customer's facility or siding or at an interchange point, and a required MARINE POLLUTANT mark is not legible or is missing:
 - (a) Notify the customer, Train Dispatcher, Yardmaster, or your supervisor, as appropriate.
 - (b) Do **not** accept the hazardous material shipment until corrections have been made.

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(3) When a required MARINE POLLUTANT mark is not legible or is missing en route, notify the Train Dispatcher, Yardmaster, or your supervisor, as appropriate. They will arrange to correct the problem at the next inspection point. c. HOT Mark (1) For a material described on the shipping papers with the words "HOT," "ELEVATED TEMPERATURE," or "MOLTEN" and transported in a bulk packaging, the word "HOT" must be marked on two opposing sides of the bulk packaging, either: (a) on a plain white square-on-point configuration having the same outside dimensions as a placard (see Figure 7); FIGURE 7. HOT MARK  or (b) on the packaging itself. NOTE 1: The word "HOT" is not required for bulk packagings of molten aluminum or molten sulfur marked "MOLTEN ALUMINUM" or "MOLTEN SULFUR," as appropriate. NOTE 2: Residue/empty shipments that last contained elevated temperature material (HOT), such as asphalt, are not considered hazardous materials and do not require hazardous material shipping description entries on the shipping paper. When the shipping paper indicates empty, the shipment may be accepted and moved in rail transportation without the hazardous material shipping description entries, even though the HOT mark and identification number are displayed. (2) When picking up a hazardous material shipment at a customer's facility or siding or at an interchange point and a HOT mark is not legible or is missing: (a) Notify the customer, Train Dispatcher, Yardmaster, or your supervisor, as appropriate. (b) Do not accept the hazardous material shipment until corrections have been made. (3) When a HOT mark is not legible or is missing en route, notify the Train Dispatcher, Yardmaster, or your supervisor, as appropriate. They will arrange to correct the problem at the next inspection point.	HM-1
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d. INHALATION HAZARD Mark (1) For a material described on the shipping papers as "Poison (Toxic) — Inhalation Hazard" or "Inhalation Hazard," the words "INHALATION HAZARD" must appear (in at least 3.9-inch high letters) on both sides of the rail car, trailer, or container near the placards. NOTE: When the words "INHALATION HAZARD" appear on the placards, the "INHALATION HAZARD" mark is not required on the bulk packaging. (2) When picking up a hazardous material shipment at a customer's facility or siding or at an interchange point and the words "INHALATION HAZARD" are illegible or missing: (a) Notify the customer, Train Dispatcher, Yardmaster, or your supervisor, as appropriate. (b) Do not accept the shipment until corrections have been made. (3) When the "INHALATION HAZARD" marking is illegible or missing en route, notify the Train Dispatcher, Yardmaster, or your supervisor, as appropriate. They will arrange to correct the problem at the next inspection point. e. Commodity Name (1) The commodity name is required on intermodal tanks transporting any hazardous materials and on tank cars transporting certain hazardous materials. The commodity name (3.9 inches in height for tank cars and 2 inches in height for intermodal tanks) must match the proper shipping name on the shipping papers and may include the technical name, although it is not specifically required. The commodity name must be on two opposing sides of the intermodal tank or tank car. (2) When accepting an intermodal tank or tank car of hazardous materials from the shipper or in interchange and the commodity name is illegible or missing: (a) Notify the customer, Train Dispatcher, Yardmaster, or your supervisor, as appropriate. (b) Do not accept the shipment until corrections have been made. (3) When the commodity name on a tank car is discovered illegible or missing en route, notify the Train Dispatcher, Yardmaster, or your supervisor, as appropriate. They will arrange to correct the problem at the next inspection point. f. Tank Car Qualification Dates (1) Make sure the stencils describing the tank car specification and qualification dates are legible. These stencils will appear on both sides of the tank car toward the end on the right as you face the car. (2) Make sure the tank car qualification dates for pressure relief devices (PRD), tank, and interior heater coils are current (a car is currently within the qualification date until the last day of the year shown) (see Figure 8).	HM-1
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FIGURE 8. TANK CAR QUALIFICATION DATE (New Style)

	STATION STENCIL	QUALIFIED	DUE
TANK QUALIFICATION	ABC-1	2002	2012
THICKNESS TEST	ABC-1	2002	2012
SERVICE EQUIPMENT	ABC-1	2002	2012
PRD:	DEF-1	2002	2012
	FGL-1	2002	2012
LINING	ABC-1	2002	2012
88.B.2 INSPECTION	ABC-1	2002	2012
STUBB SILL INSPECTION	ABC-1	2002	2012

FIGURE 8. TANK CAR QUALIFICATION DATE (Older Style Example)

DOT 112J340W	
Safety Valve	280.5 LB
Tested 2006	Due 2016
Tank	340 LB
Tested 2006	Due 2016
Blt.	03/2006

NOTE 1: When the car is loaded before the end of the year, it may be transported for unloading purposes but must be requalified before reloading.

NOTE 2: A tank car containing the residue of a hazardous material that is overdue its periodic qualification date may move and not be in violation of DOT regulations. The regulations only address loading a tank car overdue for its periodic qualification.

(3) When the qualification date is overdue, do not accept loaded tank cars from the shipper.

(4) When found en route, car may proceed to destination after contacting the supervisor.

g. FUMIGANT Mark

(1) As information, the purpose of the FUMIGANT mark (see **Figure 9**) is to warn persons unloading the rail car, trailer, or container that it has been fumigated and that they must take appropriate precautions before unloading the car. The (*) on the mark will be replaced by the name of the fumigant.

FIGURE 9. FUMIGANT MARK

DANGER

THIS UNIT IS UNDER FUMIGATION
WITH * _____
Date _____

DO NOT ENTER

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(2) The FUMIGANT mark must be in English. However, EPA regulations allow another language in addition to the English version on the same FUMIGANT mark or an additional one.

(3) **Shipping Description Entries**

(a) For U.S. shipments that are fumigated, information on the shipping papers is not required.

(b) For international (Canadian and IMDG) shipments verify that the information for the shipment on the shipping papers includes the following entries — UN 3359, Fumigated Unit, name of the fumigant, amount of fumigant, date of fumigation, and any disposal information.

h. Inspection for Non-Odorized Marks

Tank car or intermodal tank shipments containing liquified petroleum gas (LPG) that are odorized must be legibly marked NON-ODORIZED or NOT ODORIZED on two opposing sides near the marked proper shipping name or near the placards.

The NON-ODORIZED or NOT ODORIZED marks may appear on a tank car or tank container used for both odorized and odorized LPG. Shippers may include on shipping papers the information that the shipment's not odorized, if they so choose.

i. LIMITED QUANTITY Mark

(1) The words "LIMITED QUANTITY" or "LTD QTY" displayed on both sides and both ends of trailers/containers.

(a) The limited quantity mark is required:

- when the entire load of hazardous materials is limited quantities
- when a mix of non-hazardous materials and hazardous materials in limited quantity

(b) The limited quantity mark is not required:

- when there are limited quantities and other hazardous materials NOT in limited quantities, but you would placard for the regular hazardous materials

(2) Packages containing dangerous goods in limited quantities need not be marked with the proper shipping name of the contents, but shall be marked with the UN number of the contents (preceded by the letters "UN") placed within a diamond. The width of line forming the diamond shall be at least 2 mm; the number shall be at least 6 mm high. Where more than one substance is included in the package and the substances are assigned to different UN numbers, then the diamond shall be large enough to include each relevant UN number.

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FIGURE 10. SWITCHING CHART				
GROUP 3		GROUP 4		
 EXPLOSIVES 1.3	 EXPLOSIVES 1.4	 EXPLOSIVES 1.5	 EXPLOSIVES 1.6	
 FLAMMABLE 2.1	 FLAMMABLE 2.2	 INHALATION HAZARD 2.3	 INHALATION HAZARD 2.4	
 TOXIC 2.5	 TOXIC 2.6	 TOXIC 2.7	 TOXIC 2.8	
 CORROSIVE 3	 CORROSIVE 3.1	 CORROSIVE 3.2	 CORROSIVE 3.3	
 OXIDIZING 4.1	 OXIDIZING 4.2	 OXIDIZING 4.3	 OXIDIZING 4.4	
 INFECTIOUS 5.1	 INFECTIOUS 5.2	 INFECTIOUS 5.3	 INFECTIOUS 5.4	
 RADIOACTIVE 7	 RADIOACTIVE 7.1	 RADIOACTIVE 7.2	 RADIOACTIVE 7.3	
 HAZARDOUS WASTE 8	 HAZARDOUS WASTE 8.1	 HAZARDOUS WASTE 8.2	 HAZARDOUS WASTE 8.3	
 ID NO. 1	 ID NO. 2	 ID NO. 3	 ID NO. 4	
 ID NO. 5	 ID NO. 6	 ID NO. 7	 ID NO. 8	
 ID NO. 9	 ID NO. 10	 ID NO. 11	 ID NO. 12	
 ID NO. 13	 ID NO. 14	 ID NO. 15	 ID NO. 16	
 ID NO. 17	 ID NO. 18	 ID NO. 19	 ID NO. 20	
 ID NO. 21	 ID NO. 22	 ID NO. 23	 ID NO. 24	
 ID NO. 25	 ID NO. 26	 ID NO. 27	 ID NO. 28	
 ID NO. 29	 ID NO. 30	 ID NO. 31	 ID NO. 32	
 ID NO. 33	 ID NO. 34	 ID NO. 35	 ID NO. 36	
 ID NO. 37	 ID NO. 38	 ID NO. 39	 ID NO. 40	
 ID NO. 41	 ID NO. 42	 ID NO. 43	 ID NO. 44	
 ID NO. 45	 ID NO. 46	 ID NO. 47	 ID NO. 48	
 ID NO. 49	 ID NO. 50	 ID NO. 51	 ID NO. 52	
 ID NO. 53	 ID NO. 54	 ID NO. 55	 ID NO. 56	
 ID NO. 57	 ID NO. 58	 ID NO. 59	 ID NO. 60	
 ID NO. 61	 ID NO. 62	 ID NO. 63	 ID NO. 64	
 ID NO. 65	 ID NO. 66	 ID NO. 67	 ID NO. 68	
 ID NO. 69	 ID NO. 70	 ID NO. 71	 ID NO. 72	
 ID NO. 73	 ID NO. 74	 ID NO. 75	 ID NO. 76	
 ID NO. 77	 ID NO. 78	 ID NO. 79	 ID NO. 80	
 ID NO. 81	 ID NO. 82	 ID NO. 83	 ID NO. 84	
 ID NO. 85	 ID NO. 86	 ID NO. 87	 ID NO. 88	
 ID NO. 89	 ID NO. 90	 ID NO. 91	 ID NO. 92	
 ID NO. 93	 ID NO. 94	 ID NO. 95	 ID NO. 96	
 ID NO. 97	 ID NO. 98	 ID NO. 99	 ID NO. 100	
 ID NO. 101	 ID NO. 102	 ID NO. 103	 ID NO. 104	
 ID NO. 105	 ID NO. 106	 ID NO. 107	 ID NO. 108	
 ID NO. 109	 ID NO. 110	 ID NO. 111	 ID NO. 112	
 ID NO. 113	 ID NO. 114	 ID NO. 115	 ID NO. 116	
 ID NO. 117	 ID NO. 118	 ID NO. 119	 ID NO. 120	
 ID NO. 121	 ID NO. 122	 ID NO. 123	 ID NO. 124	
 ID NO. 125	 ID NO. 126	 ID NO. 127	 ID NO. 128	
 ID NO. 129	 ID NO. 130	 ID NO. 131	 ID NO. 132	
 ID NO. 133	 ID NO. 134	 ID NO. 135	 ID NO. 136	
 ID NO. 137	 ID NO. 138	 ID NO. 139	 ID NO. 140	
 ID NO. 141	 ID NO. 142	 ID NO. 143	 ID NO. 144	
 ID NO. 145	 ID NO. 146	 ID NO. 147	 ID NO. 148	
 ID NO. 149	 ID NO. 150	 ID NO. 151	 ID NO. 152	
 ID NO. 153	 ID NO. 154	 ID NO. 155	 ID NO. 156	
 ID NO. 157	 ID NO. 158	 ID NO. 159	 ID NO. 160	
 ID NO. 161	 ID NO. 162	 ID NO. 163	 ID NO. 164	
 ID NO. 165	 ID NO. 166	 ID NO. 167	 ID NO. 168	
 ID NO. 169	 ID NO. 170	 ID NO. 171	 ID NO. 172	
 ID NO. 173	 ID NO. 174	 ID NO. 175	 ID NO. 176	
 ID NO. 177	 ID NO. 178	 ID NO. 179	 ID NO. 180	
 ID NO. 181	 ID NO. 182	 ID NO. 183	 ID NO. 184	
 ID NO. 185	 ID NO. 186	 ID NO. 187	 ID NO. 188	
 ID NO. 189	 ID NO. 190	 ID NO. 191	 ID NO. 192	
 ID NO. 193	 ID NO. 194	 ID NO. 195	 ID NO. 196	
 ID NO. 197	 ID NO. 198	 ID NO. 199	 ID NO. 200	
 ID NO. 201	 ID NO. 202	 ID NO. 203	 ID NO. 204	

FIGURE 11. POSITION-IN-TRAIN CHART				
NORFOLK SOUTHERN HAZARDOUS MATERIALS POSITION-IN-TRAIN CHART		GROUP 1	GROUP 2	
HOW TO USE THIS CHART Select the applicable column of the Position-in-Train Chart by: a. Finding the placard or markings applied to the car; b. Determining the load or residue status of the car by the notation "RESIDUE: LAST CONTAINED" on the paperwork; c. Identifying the type of car involved by inspection; and then d. Finding the appropriate column based on the placard applied, load or residue status, and car type. Read and follow the restrictions associated with the placard or markings as indicated by "x"s in the columns.		 	 Hazard Zone A  Hazard Zone A	
EQUIVALENT PLACARDS  =  Cars with placards displaying 4-digit identification numbers will be handled the same as cars with word description placards.				
NOTE: The words "POISON" and "TOXIC" can be used interchangeably on placards displayed in Group 4.				
RESTRICTIONS		Any Car	Loaded Tank Car	Residue Tank Car
1	When train length permits, must not be nearer than the 6th car from an engine or any occupied caboose, showing platform, or passenger car. If length does not permit, must be near the middle of the train.	X	X	
2	Engine, any occupied caboose, showing platform or passenger car.	X	X	X
3	Open-top cars (including bulkhead flats) when any of the lading protrudes beyond the car ends or if shifted would protrude beyond the car ends.	X	X	
4	Loaded flat cars except closed TOFC/COFC equipment, multi-levels, and other specially equipped cars with tie-down devices for handling vehicles.	X	X	
5	Railroad wheels loaded on wheel car flats, in gondolas with no ends, or loaded with the axles above the top of the cars.	X	X	
6	Any rail cars, transport vehicles, or freight containers with temperature control equipment or internal combustion engine in operation.	X	X	
7	Any placarded car in another placarding Group, except it may be next to any residue placarded car or any car placarded or marked as in Group 5.	X	X	

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4. GENERAL INFORMATION a. For train placement purposes, each platform or well of an intermodal rail car counts as one car. b. A buffer car is a: (1) Non-placarded rail car. (2) Rail car with a placard or marking shown in Group 5. (3) Residue/empty tank car, as long as it complies with Restriction #2 on the Position-in-Train Chart. (4) Placarded rail car, other than a tank car, as long as it complies with Restriction #7 on the Position-in-Train Chart. c. The word "TOXIC" can appear in place of the word "POISON" on placards.	
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SECTION 8 — EMERGENCY RESPONSE 1. GENERAL REQUIREMENT In case of a hazardous materials incident, safety is the first consideration. Your responsibility, when observing an incident, is to determine the status of the incident and to immediately report the incident to the Train Dispatcher or Yardmaster. NOTE: Do not allow a leaking hazardous material shipment to continue in transportation until the leak is resolved (e.g., repaired, reconditioned, or overpacked). 2. REPORTABLE INCIDENTS Reportable incidents include: a. All unintentional or accidental releases (including very minor leaks) of hazardous materials in transportation. b. All derailments and accidents involving rail cars containing either a hazardous material, substance, or waste, including residue shipments, in which the: (1) packaging is damaged; - or (2) car is derailed and not upright, regardless of damage, leaks, or releases. c. All releases of any petroleum product (including oil, diesel fuel, gasoline, etc.) or other materials that can cause environmental damage. For example, spills on shorelines next to water, or spills that cause a sheen on the water. When in doubt, report all release incidents, regardless of the amount of material involved. 3. WHEN AN EMERGENCY OCCURS SAFETY IS OF FIRST IMPORTANCE. Carry out the following actions as closely as possible; however, on-scene judgment based on actual circumstances must be the final guide for protecting people, property, and the environment. a. Make an emergency call, as radio rules require. b. Look for a fire or vapor cloud. c. Rescue the injured if qualified, without endangering yourself or others. Warn and keep everyone at a safe distance until it can be determined what, if any, chemicals are involved. 4. WHEN A FIRE OR VAPOR CLOUD IS VISIBLE a. Take the shipping papers (including the emergency response information) and move yourself and other crew members upwind to the farthest distance recommended in the Evacuation Section of the emergency response information accompanying the shipping papers or the Emergency Response Guidebook's green pages that provide initial isolation distances.	HM-1 35
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b. Stay out of ditches and low areas. c. Remove all possible ignition sources. Do Not Smoke. d. Provide the Train Dispatcher or Yardmaster with as much of the following information as possible: (1) status of crew members; (2) cars involved, including each car's initials and numbers and its extent of involvement (for example, leaking, derailed, or on fire); (3) surroundings (for example, proximity to populated areas, local bodies of water or nearby drainage ditches or storm sewers; description of terrain; location of access roads; weather conditions); (4) resources required to handle situation (for example, fire, ambulance, and law enforcement agencies); and (5) location where a crew member with shipping papers will meet arriving emergency response personnel. e. Once you are in a safe location, identify yourself and cooperate with the local emergency response personnel as noted in Item 6 of this section. 5. WHEN NO FIRE OR VAPOR CLOUD IS VISIBLE a. Review the shipping papers for hazardous material shipments. b. Take the shipping papers (including the emergency response information) and inspect the train to identify the rail cars, trailers, or containers involved, and look for indications of the release of hazardous materials. c. When you encounter released hazardous materials during this inspection: (1) avoid contact with the material and its vapors; (2) move yourself and other crew members upwind to the farthest distance recommended in the Evacuation Section of the emergency response information accompanying the shipping papers, or the Emergency Response Guidebook's green pages that provide initial isolation distance; (3) stay out of ditches and low areas; (4) remove all possible ignition sources. Do Not Smoke; and (5) warn all bystanders to stay away. d. After completing the inspection, notify the Train Dispatcher or Yardmaster with as much of the following information as possible: (1) status of crew members; (2) cars involved, including each car's initials and numbers and its extent of involvement (for example, leaking, derailed, or on fire); (3) surroundings (for example, proximity to populated areas, local bodies of water or nearby drainage ditches or storm sewers; description of terrain; location of access roads; weather conditions); (4) resources required to handle situation (for example, fire, ambulance, and law enforcement agencies); and (5) location where a crew member with shipping papers will meet arriving emergency response personnel. e. Once you are in a safe location, identify yourself and cooperate with the local emergency response personnel as noted in Item 6 of this section.	36 HM-1
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6. COOPERATING WITH LOCAL EMERGENCY RESPONDERS a. Share any requested information from the shipping papers with emergency response personnel. (1) Provide an extra copy of the train consist/list, if available. (2) Provide the Emergency Response Guidebook along with a copy of the emergency response information provided with the shipment. (3) Note the time, along with the name and title of the person provided with this information. b. Help emergency response personnel identify cars and the commodities involved. Use shipping papers or observations from a safe location to accomplish this task. c. Provide a full report of the incident, and any assistance you gave to the emergency responders, to the first railroad manager on the scene. 7. HANDLING LEAKING HAZARDOUS MATERIAL SHIPMENTS Do not move a leaking rail car containing a hazardous material unless it is necessary to reduce or eliminate an immediate threat of harm to human health or the environment. a. An adequate number of buffer cars must be used between the locomotive and the leaking car to prevent chemical exposure. b. Short movements may be made if a receptacle is attached under the leak to prevent the spread of product. c. If safe to do so, switch cars containing leaking hazardous materials to a location distant from habitation, waterways, and highways.	37	HM-1
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SECTION 9 — RAIL SECURITY SENSITIVE MATERIALS 1. GENERAL REQUIREMENT Loaded rail cars, trailers, or containers carrying any Rail Security Sensitive Materials (RSSM) must be handled in accordance with the rules in this section. 2. RAIL SECURITY SENSITIVE MATERIAL DEFINITION A "Rail Security Sensitive Material" or RSSM is described in either a, b, or c below: a. A rail car, trailer, or container containing more than 5,000 lbs. of a Division 1.1, 1.2, or 1.3 explosive material. b. A loaded tank car containing a Toxic Inhalation Hazard (TIH), including Anhydrous Ammonia, Division 2.3 gases such as Chlorine, or Division 6.1 poison liquids. A list of all TIH materials is included in Section 1, Table 3. c. A rail car containing a highway-route controlled quantity of Class 7 (radioactive) material shipped under any of the following HazMat STCCs or Hazardous Materials Response Codes — 4929142, 4929143, 4929144, 4929147. 3. INSTRUCTIONS FOR RECEIVING RSSM SHIPMENTS FROM A SHIPPER a. Loaded rail cars, trailers or containers of RSSM shipments may only be picked up from a Rail Secure Area in a customer's facility. A Rail Secure Area is a pre-designated physically secure location identified by a rail hazardous materials shipper or receiver for the purpose of inspecting, preparing, loading, storing, and/or unloading RSSM shipments. b. When picking up a loaded Rail Security Sensitive Material from a shipper: (1) A hazardous materials and security inspection must be performed as instructed in Section 3 — Car Inspection. (2) The shipper must have a representative physically present at the car when the railroad pulls the car so that "Positive Control" is maintained at all times. (3) The shipper representative and the Conductor must both complete a Chain-of-Custody form. (4) The shipper will be supplied the Chain-of-Custody form by the CYO or may use its own form with the same required information. The Conductor must ensure that any time RSSM is picked up, the crew completes a Chain-of-Custody form, and the Conductor must fax the completed form to CYO at the end of their shift but prior to the Hours of Service limit.	38	HM-1
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(5) If the industry work order indicates that an RSSM shipment is to be pulled and there is no shipper representative present or a Chain-of-Custody form is not completed, the shipment must not be pulled from the customer's facility.

4. INSTRUCTIONS FOR DELIVERING RSSM TO A CONSIGNEE

When delivering RSSM shipments to NS customers, the Chain-of-Custody documentation and "Positive Control" requirements for RSSM shipments is only required for customers located in a High Threat Urban Area or HTUA. HTUA locations have been designated by the U.S. Department of Homeland Security based on the threat, vulnerability, and consequences calculated for various metropolitan areas.

The following HTUA locations are located on the Norfolk Southern system:

- Atlanta, GA
- Baltimore, MD
- Buffalo, NY
- Charlotte, NC
- Chicago, IL
- Cincinnati, OH
- Cleveland, OH
- Columbus, OH
- Detroit, MI
- Jacksonville, FL
- Jersey City/Newark, NJ
- Kansas City, MO
- Louisville, KY
- Memphis, TN
- New Orleans, LA
- Philadelphia, PA
- Pittsburgh, PA
- St. Louis, MO
- Toledo, OH
- Washington, DC

a. Loaded rail cars, trailers or containers of RSSM shipments may only be placed in the consignee's pre-designated Rail Secure Area in the customer's facility.

b. When delivering a loaded Rail Security Sensitive Material to a consignee in a HTUA:

- (1) The consignee must have a representative physically present at the car when the railroad delivers the car so that "Positive Control" is maintained at all times.
- (2) The consignee representative and the Conductor must both complete a Chain-of-Custody form.
- (3) Receivers of RSSM shipments will be noted on industry work orders. The Conductor must ensure that any time RSSM is delivered, the crew completes a Chain-of-Custody form, and the Conductor must fax the completed form to CYO at the end of their shift but prior to the Hours of Service limit.
- (4) If the industry work order indicates that an RSSM shipment is to be delivered and there is no consignee representative present or a Chain-of-Custody form is not completed, the shipment must not be placed at the customer's facility.

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5. INSTRUCTIONS FOR INTERCHANGING RSSM SHIPMENTS

a. The instructions for interchanging RSSM shipments do not apply at the following interchange locations:

Connecting Carrier	Location
AGR	Kimbrough, AL
CERA	Marion, IN
CSXT	Brunswick, GA
CSXT	Evansville, IN
CSXT	Hopewell, VA
CSXT	Pt. Pleasant, WV
CSXT	Valdosta, GA
GFRR	Albany, GA
GITM	Anguilla Jct., GA
HPTD	High Point, NC
ICRK	Anderson, IN
IN	Montpelier, OH
KCS	Hattiesburg, MS
LVRR	Northumberland, PA
MDDE	Townsend, DE
MIDH	Middletown, PA
RJCL	Massillon, OH
RSR	Silver Springs, NY
TPW	Logansport, IN
TYBR	Fairless, PA

b. Loaded rail cars, trailers or containers of RSSM shipments may only be interchanged at an attended location, which is defined as:

- (1) a location where a railroad employee or authorized representative is physically located in reasonable proximity to the RSSM rail car;
- (2) can reasonably detect unauthorized access or unlawful activity near the rail car; and
- (3) the person in attendance can promptly respond to unauthorized access or activity near the rail car. For example, someone capable of immediately contacting law enforcement or other authorities to investigate.

c. When delivering or receiving RSSM shipment in interchange:

- (1) Both of the interchanging rail carriers are required to complete a Chain-of-Custody form. These Chain-of-Custody forms will be included in the crew's paperwork when an RSSM car is present in the train.
- (2) Both interchanging carriers must have a representative physically present at the car at the time of pickup or delivery.
 - (a) When a foreign line carrier brings an interchange cut or train to an NS yard, the NS Yardmaster will be the chain-of-custody contact (either directly or by voice communication) in attended

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yards. The NS Yardmaster should complete the Chain-of-Custody form.

- (b)** When interchange cuts or trains are delivered by NS crews to a foreign line carrier yard, the crew should contact CYO or the NS Yardmaster and request a Wheel Report for the interchange cut, prior to departure. The Wheel Report will include the Chain-of-Custody forms. The Conductor must ensure that the Chain-of-Custody form is completed.
- (3)** The NS Yardmaster or Conductor completing the Chain-of-Custody forms when cars are handled in interchange must fax the completed form to CYO during or at the end of their shift. Chain-of-Custody information must be provided to CYO prior to the crew's Hours of Service limit.
- (4)** When delivering RSSM shipments in interchange, if the foreign line does not have a representative present to document the Chain-of-Custody, the shipment must not be interchanged.
- (5)** When picking up RSSM shipments at interchange from a foreign line carrier who has left the cars unattended, the NS crew may pickup the RSSM cars provided:

 - (a)** Yardmaster, control station, or supervisor, is made aware of the unattended status and has authorized the pickup (after attempting to reach the delivering carrier).
 - (b)** A hazardous materials and security inspection is performed as instructed in **Section 3 — Car Inspection**.
 - (c)** A Chain-of-Custody form is completed and the notation "Unattended" is entered in the blank space provided for the foreign carrier employee first and last name.

6. CHAIN-OF-CUSTODY FORM

- a. A blank copy of the Chain-of-Custody form is shown in **Figure 12**.
- b. The following information must be completed on the Chain-of-Custody form:
 - (1) the date and time;
 - (2) the location of the industry or interchange;
 - (3) the shipper, consignee, or rail carrier name when picking up or delivering RSSM shipments;
 - (4) the first and last names of the representatives participating in the transfer (NS employees, foreign rail carrier, shipper, or consignee as applicable); and
 - (5) the car initials and number for all RSSM shipments.
- c. Chain-of-Custody information must be provided to CYO prior to the crew's Hours of Service limit. If a crew determines they will not be able to fax the Chain-of-Custody form to CYO prior to expiration of their Hours of Service limit, information from the form must be provided to CYO using an alternate means; including use of a radio. A phone may be used but only if all FRA and Norfolk Southern requirements governing the on-duty use of electrical/electronic devices have been met. The Chain-of-Custody paperwork must then be faxed to CYO at the start of the crew's next tour of duty.

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FIGURE 12. CHAIN-OF-CUSTODY FORM FOR RSSM SHIPMENTS

NOTE: Print legibly

The listed or attached Rail Security Sensitive Materials (RSSM) have changed custody between the parties listed:

Date: ____/____/____
(DD/MM/YYYY)

Time: ____:____

AM
PM (Circle One)

Place / Pull / Interchange Location:
(Circle One)

(Location Name)

Shipper / Consignee:
(Circle One)

(Company Name)

Shipper / Consignee:
(Circle One)

(Employee First and Last Name)

Foreign Carrier: _____
(Road Initial)

(Employee First and Last Name)

Norfolk Southern: _____ (Employee First and Last Name) _____ (NS ID #)

Initial	Number	Initial	Number
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9
10	10	10	10
11	11	11	11
12	12	12	12
13	13	13	13
14	14	14	14
15	15	15	15
16	16	16	16
17	17	17	17
18	18	18	18
19	19	19	19
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45	45	45	45
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72	72	72	72
73	73	73	73
74	74	74	74
75	75	75	75
76	76	76	76
77	77	77	77
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87	87	87	87
88	88	88	88
89	89	89	89
90	90	90	90
91	91	91	91
92	92	92	92
93	93	93	93
94	94	94	94
95	95	95	95
96	96	96	96
97	97	97	97
98	98	98	98
99	99	99	99
100	100	100	100

Completed copy should be faxed to CYO @ 1-800-476-0180 prior to end of shift.

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GLOSSARY Buffer Car — A non-placarded rail car, a rail car with a placard or marking shown in Group F on the Switching Chart or Group E on the Position-in-Train Chart, a residue/empty tank with no other restrictions, or a placarded rail car with no other restrictions. Bulk Packaging — Packaging with capacity greater than 119 gallons or 882 pounds. For example, bulk bags, intermodal (IM) portable tanks, portable tanks, portable bins, gondola cars, hopper cars, or tank cars. Container — Any freight container, intermodal (IM) portable tanks, portable tank, or portable bin. Emergency — An unforeseen combination of circumstances or the resulting state that calls for immediate action (for example, derailment and leaks). Emergency Response Information — Hazard and response information for each hazardous material, contained in either the train documentation or the <i>Emergency Response Guidebook</i> (ERG), to assist response personnel at hazardous material incidents. Hazard Class — The category of hazard assigned to a material. A class may be subdivided into divisions for clarity. A class may be expressed as a number or with words. Hazardous Material — A substance or material which the Secretary of Transportation has determined to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce. The term "hazardous material" includes hazardous substances, hazardous wastes, elevated temperature materials (HOT or MOLTEN), and marine pollutants. Hazardous Material Shipment — A hazardous material in rail cars, trailers, or containers in rail transportation. All hazardous material shipments require shipping papers. When moved in rail cars, trailers, or containers, hazardous material shipments may or may not be placarded or marked with an identification number. Hazardous Waste Manifest — A document specifically for tracking hazardous wastes in transportation. It contains the shipping description and identifies the waste generator, each transporter, and the disposal facility. Hazard Zone — One of four levels of inhalation hazard (Hazard Zones A through D) assigned to gases, and one of two levels of hazard (Hazard Zones A and B) assigned to liquids that are poisonous/toxic by inhalation. For example, when the hazard zone is "A," it is shown on the shipping paper as "Zone A." Zone A is the most hazardous, and Zone D is the least hazardous. Improvised Explosive Device (IED) — A device fabricated in an improvised manner incorporating explosives or destructive, lethal, noxious, pyrotechnic, or incendiary chemicals in its design. This device generally includes a power supply, a switch or timer, and a detonator or initiator. Interchange — The process of transferring rail cars to or from another railroad.	43	HM-1
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Limited Quantity (LTD QTY) — A term used on shipping papers to indicate a hazardous material shipment which is allowed an exception to the labeling, packaging, and placarding requirements because the hazard associated with a small package is low. Marking — A descriptive commodity name, identification number, caution (such as INHALATION HAZARD, HOT, MOLTEN, or MARINE POLLUTANT), or tank car test date displayed on hazardous material shipments. (See Section 4 for marking requirements.) Movement Approval — A one time authorization to move a non-conforming package not meeting the applicable hazardous material regulations. This provides no relief of any regulations other than specifically stated in the approval. N.O.S. — Initials, found on shipping papers, which mean "Not Otherwise Specified." Non-Bulk Packaging — Packaging with a capacity equal to or less than 119 gallons or 882 pounds. For example, bags, bottles, boxes, cylinders, or drums. ORM-D (Other Regulated Materials) — A material such as a consumer commodity that, due to its form, quantity, and packaging, presents such a limited hazard that it is not subject to the hazardous material regulations when transported by rail. Packing Group — A grouping of hazardous materials according to the degree of danger: • Packing Group I (shown as "PGI" or "I" on the shipping papers) indicates great danger. • Packing Group II (shown as "PGII" or "II" on the shipping papers) indicates medium danger. • Packing Group III (shown as "PGIII" or "III" on the shipping papers) indicates minor danger. Placard — A sign measuring 10% by 10% inches square-on-point, communicating a hazard by symbol, color, and words or numbers. Some placards must be displayed on a square background which is white with a black border (see Figure 4, pages 18–19 for pictures of placards). Placarded Car — A rail car displaying placards in accordance with DOT regulations. Poison/Toxic Inhalation Hazard (PIH or TIH) or Inhalation Hazard — Terms used to identify certain gases and liquids that may cause health problems if breathed in very low concentrations for short periods of time. Position-in-Train Document — A document showing the current position of all hazardous material shipments within the train. This document could be the train consist/Train List or a separate document specifically for this purpose. Radio Waybill — A form used to record shipping description entries provided orally. Rail Car — Equipment used in rail transportation. For example, box car, flat car, gondola car, hopper car, tank car, or caboose, but not an engine.	HM-1	44
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Residue — The hazardous material remaining in a packaging, including a tank car, after its contents have been unloaded to the maximum extent possible. It is indicated on the shipping papers by the phrase "RESIDUE: LAST CONTAINED" before the proper shipping name. Special Permit — A document issued by the Associate Administrator under the authority of 49 U.S.C. 5117 permitting a person to perform a function that is not otherwise permitted under subchapter A or C of this chapter, or other regulations issued under 49 U.S.C. 5101 et seq. (e.g., Federal Motor Carrier Safety routing requirements). The terms "special permit" and "exemption" have the same meaning for purposes of subchapter A or C of this chapter or other regulations issued under 49 U.S.C. 5101 through 5127. An exemption issued prior to October 1, 2005 remains valid until it is past its expiration date, terminated by the Associate Administrator, or issued as a special permit, whichever occurs first. Shipper's Certification — A signed (or electronically printed) declaration on the shipping paper provided by the shipper to the first transporter for a loaded hazardous material shipment. It indicates compliance with the DOT regulations. The certification must be signed by hand or mechanically. It may read either: "This is to certify that the above-named materials are properly classified, described, packaged, marked, and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation." or "I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name, and are classified, packaged, marked, and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations." NOTE: A shipper's certification is required on any shipping paper that the customer provides to the crew for loaded hazardous material cars. Shipping Paper — Any document providing the appropriate entries for a hazardous material shipment. (See Section 2 for shipping paper requirements.) Switching — The operation of moving rail cars within a yard, at a customer's facility, or at an interchange point, in order to place them in a train or on a classification, repair, or storage track. It does not include moving rail cars to or from a shipper's facility or industry track into or out of the yard. Technical Name — A recognized chemical name used in scientific and technical handbooks, journals, and texts to further identify a hazardous material. Toxic Inhalation Hazard (TIH) — Terms used to identify certain gases and liquids that may cause health problems if breathed in very low concentrations for short periods of time. Train — One or more engines coupled, with or without rail cars, displaying a marker, requiring an appropriate air brake test, and authorized to operate on a main track. Yard — A system of tracks, other than main tracks and sidings, used for making up and breaking up trains and for other purposes such as repair or storage of cars.	45 HM-1
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APPENDIX A tank car containing any of the following materials must be marked on each side with the key words of the proper shipping name specified for the material or with a common name authorized for the material, such as Liquefied Petroleum Gas: Division 2.1 materials Division 2.3 materials Acrolein, stabilized Ammonia, anhydrous, liquefied Ammonia solutions (<i>more than 50% ammonia</i>) Bromine or Bromine solutions Bromine chloride Chloroprene, stabilized Dispersant gas or Refrigerant gas Formic acid Hydrocyanic acid, aqueous solutions Hydrofluoric acid, solution Hydrogen cyanide, stabilized (<i>less than 3% water</i>) Hydrogen fluoride, anhydrous Hydrogen peroxide, aqueous solutions (<i>greater than 20% hydrogen peroxide</i>) Hydrogen peroxide, stabilized Hydrogen peroxide and peroxyacetic acid mixtures Nitric acid (<i>other than red fuming</i>) Phosphorus, amorphous Phosphorus, white dry or Phosphorus, white, under water or Phosphorus, white, in solution, or Phosphorus, yellow dry or Phosphorus, yellow, under water or Phosphorus, yellow, in solution Phosphorus white, molten Potassium nitrate and sodium nitrate mixtures Potassium permanganate Sulfur trioxide, stabilized Sulfur trioxide, uninhibited NOTE: (1) Many other materials, hazardous and non-hazardous, <i>may</i> have the name stenciled on the car at the discretion of the shipper or car owner. The above listed materials must, by regulation, have the name stenciled on each side of the tank car. (2) The parts of the names above that appear in italics are not required to be stenciled.	46 HM-1
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FIGURE 2. EXAMPLE OF RADIO WAYBILL

NOTE: Print legibly

HAZARDOUS MATERIAL

1. Train Number _____
 2. Number of Cars from Head End _____
(Update the position-in-train documents)
 3. Car Initial & No. _____
 4. 1/ Car Load or Residue Last Contained (Circle One)
- *** DESCRIPTION OF ARTICLES *****
5. Number of Packages/Car _____
 6. Proper Shipping Name _____
 7. Technical Name (_____)
 8. Primary Hazard Class _____
Secondary Hazard Class _____
 9. UN/NA Id. No. _____
 10. Packing Group (PG): I II III (Circle One)
 11. Reportable Quantity (RQ): (_____)

***** ADDITIONAL INFORMATION *****

12. Poison/Toxic-Inhalation Hazard:
Zone A Zone B Zone C Zone D (Circle One)
13. Marine Pollutant (_____)
14. DOT Special Permit Number(s): _____
15. Additional Information _____
16. ERP Plan No.: _____
(Canadian Shipments Only)
17. ERP Telephone No.: (_____) - _____
(Canadian Shipments Only)
18. Emergency Contact (_____) - _____
(_____) - _____

Completed:

Date: _____ / _____ / _____ Time: _____ : _____ AM
MO DAY YR PM**FIGURE 2. EXAMPLE OF RADIO WAYBILL**

NOTE: Print legibly

HAZARDOUS MATERIAL

1. Train Number _____
 2. Number of Cars from Head End _____
(Update the position-in-train documents)
 3. Car Initial & No. _____
 4. 1/ Car Load or Residue Last Contained (Circle One)
- *** DESCRIPTION OF ARTICLES *****
5. Number of Packages/Car _____
 6. Proper Shipping Name _____
 7. Technical Name (_____)
 8. Primary Hazard Class _____
Secondary Hazard Class _____
 9. UN/NA Id. No. _____
 10. Packing Group (PG): I II III (Circle One)
 11. Reportable Quantity (RQ): (_____)

***** ADDITIONAL INFORMATION *****

12. Poison/Toxic-Inhalation Hazard:
Zone A Zone B Zone C Zone D (Circle One)
13. Marine Pollutant (_____)
14. DOT Special Permit Number(s): _____
15. Additional Information _____
16. ERP Plan No.: _____
(Canadian Shipments Only)
17. ERP Telephone No.: (_____) - _____
(Canadian Shipments Only)
18. Emergency Contact (_____) - _____
(_____) - _____

Completed:

Date: _____ / _____ / _____ Time: _____ : _____ AM
MO DAY YR PM

FIGURE 12. CHAIN-OF-CUSTODY FORM FOR RSSM SHIPMENTS

NOTE: Print legibly

The listed or attached Rail Security Sensitive Materials (RSSM) have changed custody between the parties listed:

Date: / /
(DD/MM/YYYY)

Time: :
AM PM (Circle One)

Place / Pull / Interchange Location:
(Circle One)

(Location Name)

Shipper / Consignee:
(Circle One)

(Company Name)

Shipper / Consignee:
(Circle One)

(Employee First and Last Name)

Foreign Carrier: _____
(Road Initial)

(Employee First and Last Name)

Norfolk Southern: _____ (Employee First and Last Name) _____ (NS ID #)

Initial Number	Initial	Number
----------------	---------	--------

Completed copy should be faxed to CYO @ 1-800-476-0180 prior to end of shift.

FIGURE 12. CHAIN-OF-CUSTODY FORM FOR RSSM SHIPMENTS

NOTE: Print legibly

The listed or attached Rail Security Sensitive Materials (RSSM) have changed custody between the parties listed:

Date: ____/____/____
(DD/MM/YYYY)

Time: ____:____
AM PM (Circle One)

Place / Pull / Interchange Location:
(Circle One)

(Location Name)

Shipper / Consignee:
(Circle One)

(Company Name)

Shipper / Consignee:
(Circle One)

(Employee First and Last Name)

Foreign Carrier: _____

 (Road Initial) (Employee First and Last Name)

Norfolk Southern: _____ (Employee First and Last Name) _____ (NS ID #)

Initial Number	Initial	Number
----------------	---------	--------

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